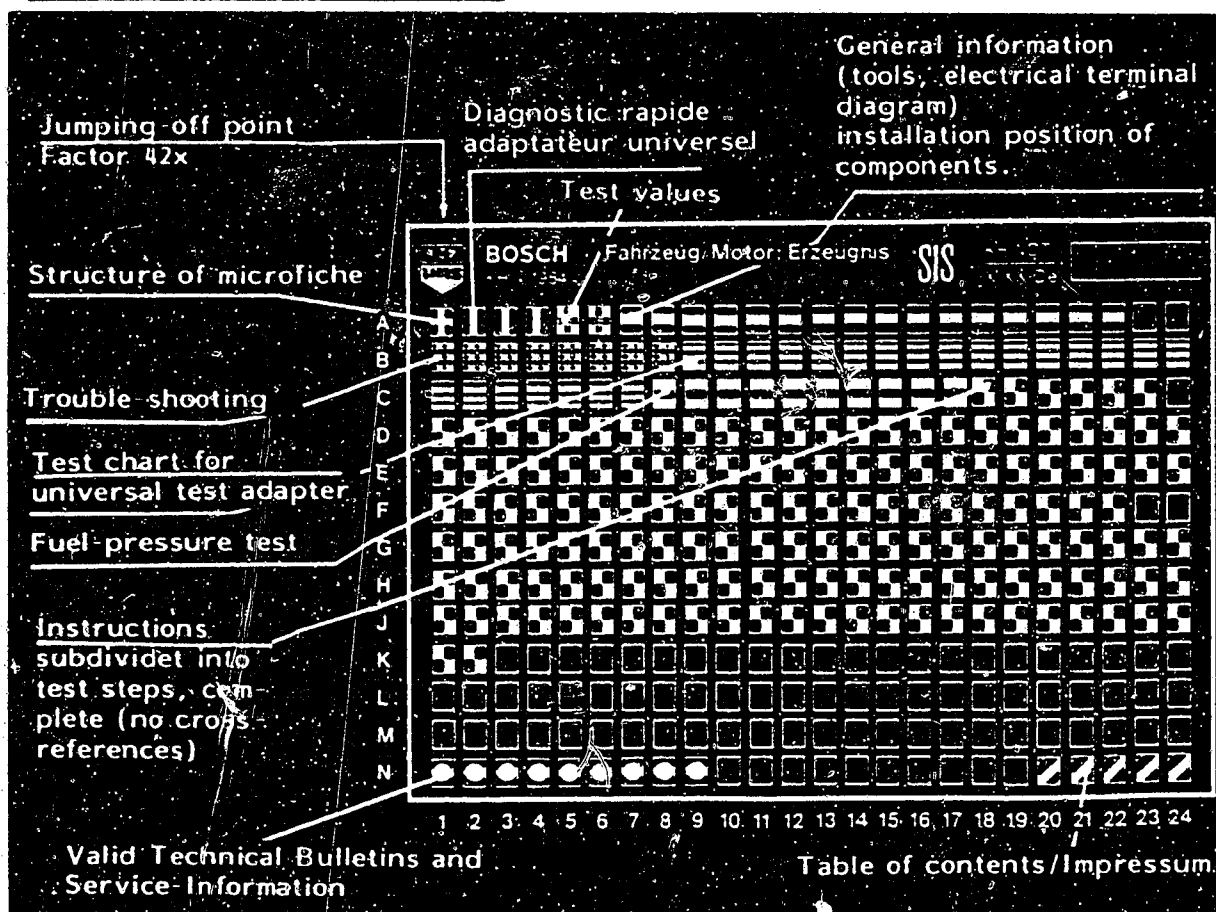


Structure of microfiche

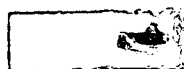


1. Read from left to right
2. Title of microfiche (appears on each coordinate)

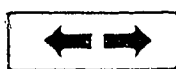
E16	Product/component/test step
	Vehicle/engine

Coordinate

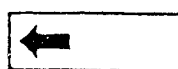
3. Limits of section



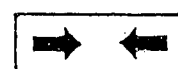
Beginning



Mid-section



End



One-page section

4. Purely vehicle-specific passages in the text are marked with a vertical bar.

5. Reference to relevant working steps in the test specifications, e.g. coordinate C6.

C6

A1

Trouble-shooting program



RAPID DIAGNOSIS CHART FOR UNIVERSAL TEST ADAPTER

The following rapid diagnosis chart makes it possible for the experienced L-Jetronic expert to quickly check the electrical part of the system using the universal test adapter.

The rapid diagnosis chart contains the following information:

- Sequence of test steps
- Position of V and Ω program switches
- Notes on how to operate the universal test adapter or other components
- Test specifications for motortester and multimeter
- Reference to coordinates of the respective detailed testing and trouble-shooting program.

If detailed instructions and information are necessary, always proceed in accordance with the trouble-shooting charts starting on Coordinates B1/B2.

A2

Rapid diagnosis chart for univ.test adap.
Fiat Argenta 120 i.e.



Rapid Diagnosis Chart for Universal Test Adaptor

Test Step	Switch Position		Measurement	Remarks	Test Specifications (reading)	For trouble-shooting see coordinate
	V	Ω				
1	5	-	Voltage pulses from ignition coil term. 1 Control-unit plug term. 1, to term. 5.	Shift gear to neutral, start.	Ignition pulses on oscilloscope	B 11
2	6	-	Voltage from control relay term. 87 Control-unit plug term. 9 to term. 5.	Shift gear to neutral, start.	8 ... 15 V	B 13
3	7	-	Voltage from starting motor term. 50 Control-unit plug term. 4 to term 5.	Shift gear to neutral, start.	5 ... 10 V	B 15
4	↓	11	Resistance of temperature sensor NTC I at control-unit plug term. 8 to term. 5.	---	100 ... 200 Ω	B 17
5	↓	12	Resistance of air-flow sensor potentiometer at control-unit plug term. 7 to term. 5.	Deflect air-flow sensor flap as far as it will go.	60 ... 1000 Ω	B 19
6	↓	13	Resistance of temperature sensor NTC II (engine temperature) at control-unit plug term. 10 to term. 5.	---	(+ 15°C ... 30°C): 1.3 k Ω ... 3.6 k Ω + 80°C: 250 ... 390 Ω	B 21
7	↓	14	Resistance of ground-output stage at control-unit plug term. 13 to term. 5.	---	0 ... 10 Ω	B 23
8	↓	16	Resistance of idle contact in throttle-valve switch at control-unit plug term. 2 to term. 9.	Accelerator in rest position	0 ... 10 Ω	C 1
9	↓	17	Resistance of full-load contact in throttle-valve switch at control-unit plug term. 3 to term. 9.	Accelerator in full-load position	0 ... 10 Ω	C 3
10	↓	18	Resistance of all 4 parallel-connected injection valves at control-unit plug term. 12 to term. 9.	---	+ 20°C: 7.0... 9.5 Ω + 80°C: 7.2... 10.0 Ω	C 5

A3

Rapid diagnosis chart
Fiat Argenta 120 i.e.



A4

Rapid diagnosis chart
Fiat Argenta 120 i.e.



TEST SPECIFICATIONS

- Idle speed

Manually-shifted transmission 800...900 min⁻¹
Automatic transmission (selector lever in position "D" and hand brake on): 700...800 min⁻¹

B7

- Exhaust-gas setting, CO concentr.

(with engine at normal oper.temp.) 1.5...2.5% by Vol.CO

- Fuel pressure

2.8...3.2 bar

B5

- Delivery of electric fuel pump

min.675 cm³/30s

B7

- Solenoid-operated injection valve

Electrical internal resistance at + 20°C: 15.0...17.5 Ω

B7

- Temperature sensor II (engine)

Electrical internal resistance at ambient temperature (+15°C...+30°C):
with engine at op.temp. (approx. +80°C):

1.3...3.6 kΩ

250...390 Ω

B9**A5**

Test specifications

Fiat Argenta 120 i.e.



- Auxiliary-air device

B5

Electrical internal
resistance

35...75 Ω

- Air-flow sensor

B5

Resistance between:

Term. 8 and term. 5:	<u>340... 450 Ω</u>
Term. 7 and term. 5:	<u>60...1000 Ω</u> *
Term. 8 and term. 9:	<u>160... 300 Ω</u>
Term. 9 and term. 5:	<u>500... 760 Ω</u>

* Pivot the sensor plate as far as the stop.

- Thermo-time switch
(35°C/8 s)

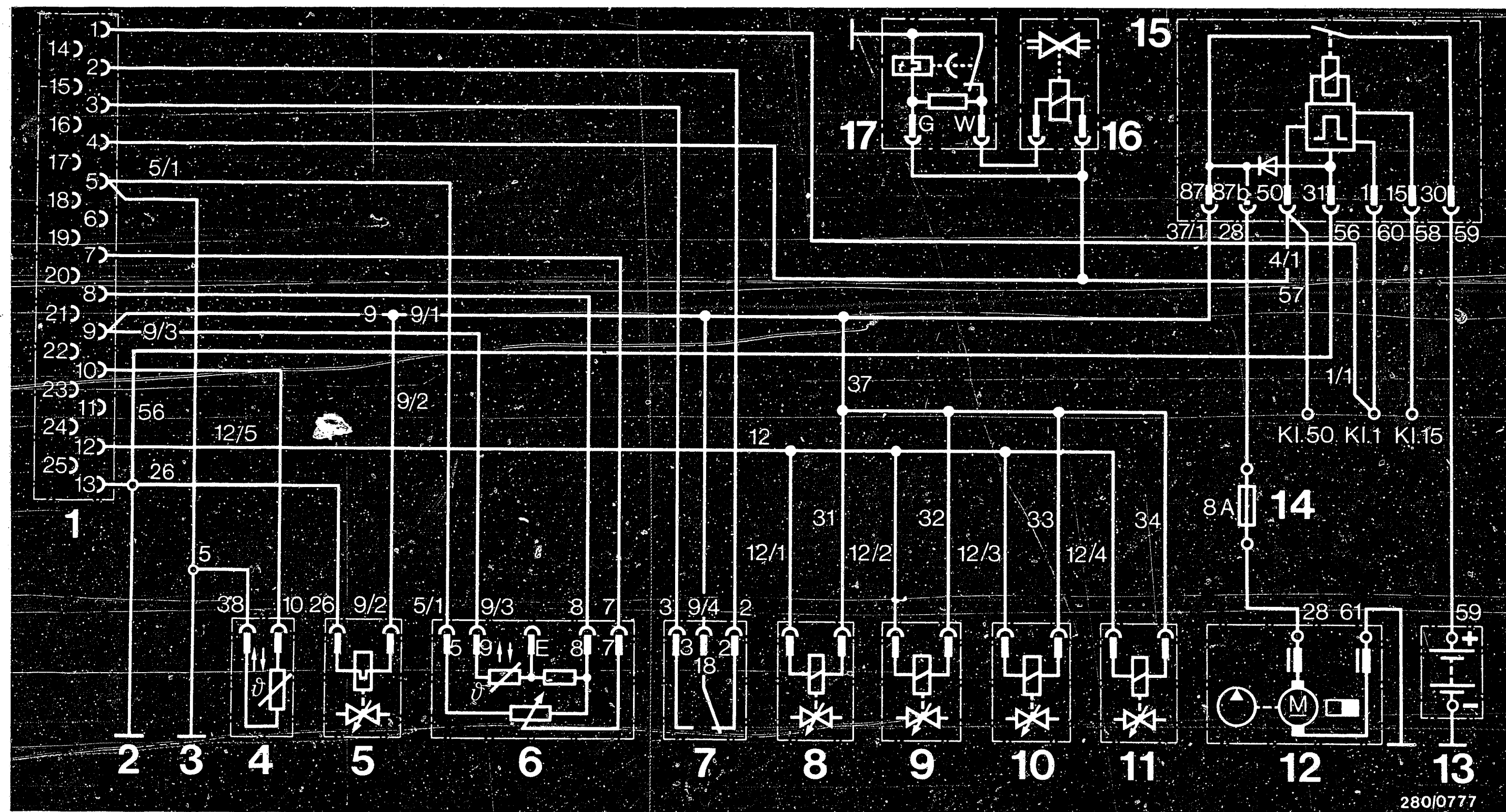
Electrical internal resistance at	Between term. "G" + ground	Between term. "W" + ground	Between term. "G" + "W"
Ambient temperature (below +30°C)	25...40 Ω	0 Ω	25...40 Ω
Engine at operating temperature (above +40°C)	50...80 Ω	100...160 Ω	50...80 Ω

See equipment and Autodata microfiches for settings
for ignition, valve clearance and other engine data.

A6

Test specifications
Fiat Argenta 120 i.e.





280/0777

ELECTRICAL TERMINAL DIAGRAM

1 = Control-unit plug to control unit
 2 = Output stage ground terminal
 3 = Electronics ground terminal

4 = Temperature sensor II (engine temperature)
 5 = Auxiliary-air device
 6 = Air-flow sensor

7 = Throttle-valve switch
 8,9,10,11 = Injection valves
 12 = Electric fuel pump
 13 = Battery

14 = Pump fuse
 15 = Control relay
 16 = Start valve
 17 = Thermo-time switch

A7

Electrical wiring diagram

Fiat Argenta 120 i.e.

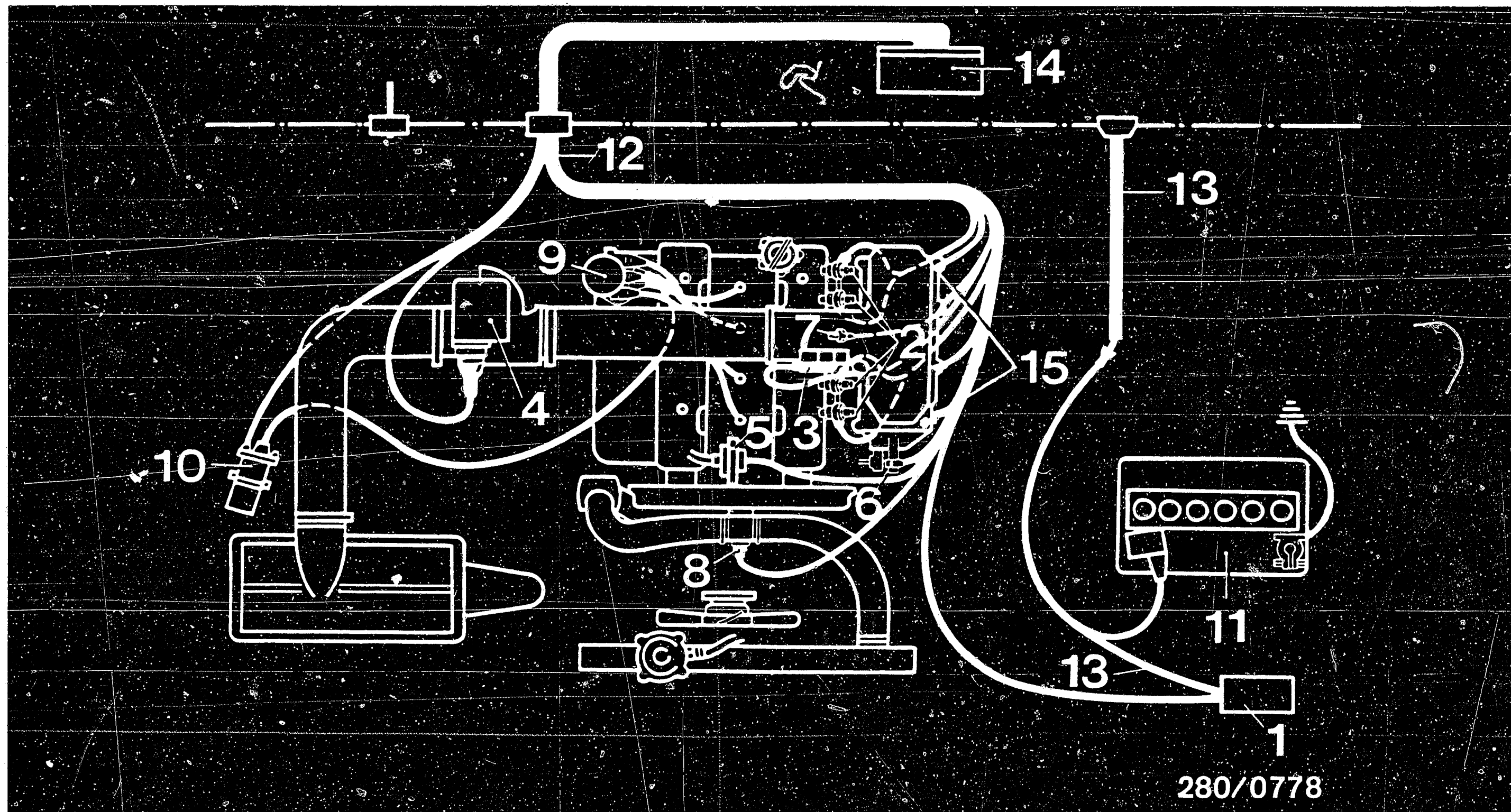


A8

Electrical wiring diagram

Fiat Argenta 120 i.e.





280/0778

ELECTRICAL WIRING DIAGRAM

- | | |
|---------------------------|---------------------------|
| 1 = Control relay | 6 = Start. valve |
| 2 = Injection valves | 7 = Thermo-time switch |
| 3 = Throttle-valve switch | 8 = Temperature sensor II |
| 4 = Air-flow sensor | 9 = Ignition distributor |
| 5 = Auxiliary-air device | 10 = Ignition coil |

- | |
|------------------------------|
| 11 = Battery |
| 12 = Jetronic wiring harness |
| 13 = Vehicle wiring harness |
| 14 = Control unit |
| 15 = Ground terminal |

A9

Electrical wiring diagram
Fiat Argenta 120 i.e.



A10

Electrical wiring diagram
Fiat Argenta 120 i.e.



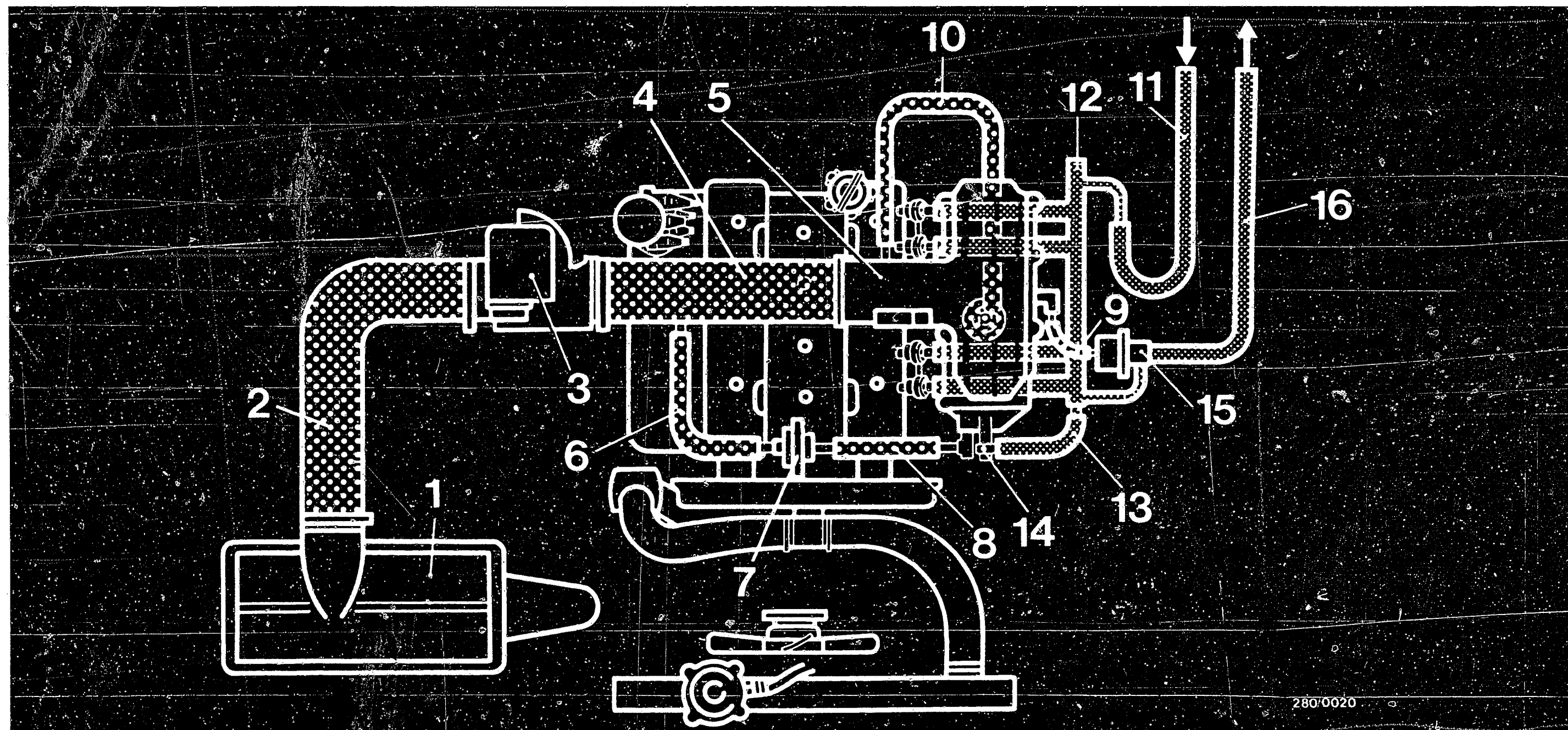


DIAGRAM OF AIR AND FUEL LINES

 = air
  = fuel

- 1 = Air filter
- 2 = Air hose between air filter and air-flow sensor
- 3 = Air-flow sensor

- 4 = Air hose between air-flow sensor and intake manifold
- 5 = Intake manifold with throttle valve
- 6 = Connecting hose for auxiliary-air device

- 7 = Auxiliary-air device
- 8 = Connecting hose from auxiliary-air device to intake manifold
- 9 = Connecting hose to pressure regulator
- 10 = Breather hose for oil vapors of engine

- 11 = Fuel supply line
- 12 = Fuel-distribution pipe
- 13 = Supply line to start valve
- 14 = Start valve
- 15 = Pressure regulator
- 16 = Fuel return line

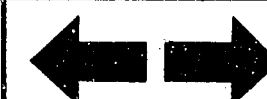
A11

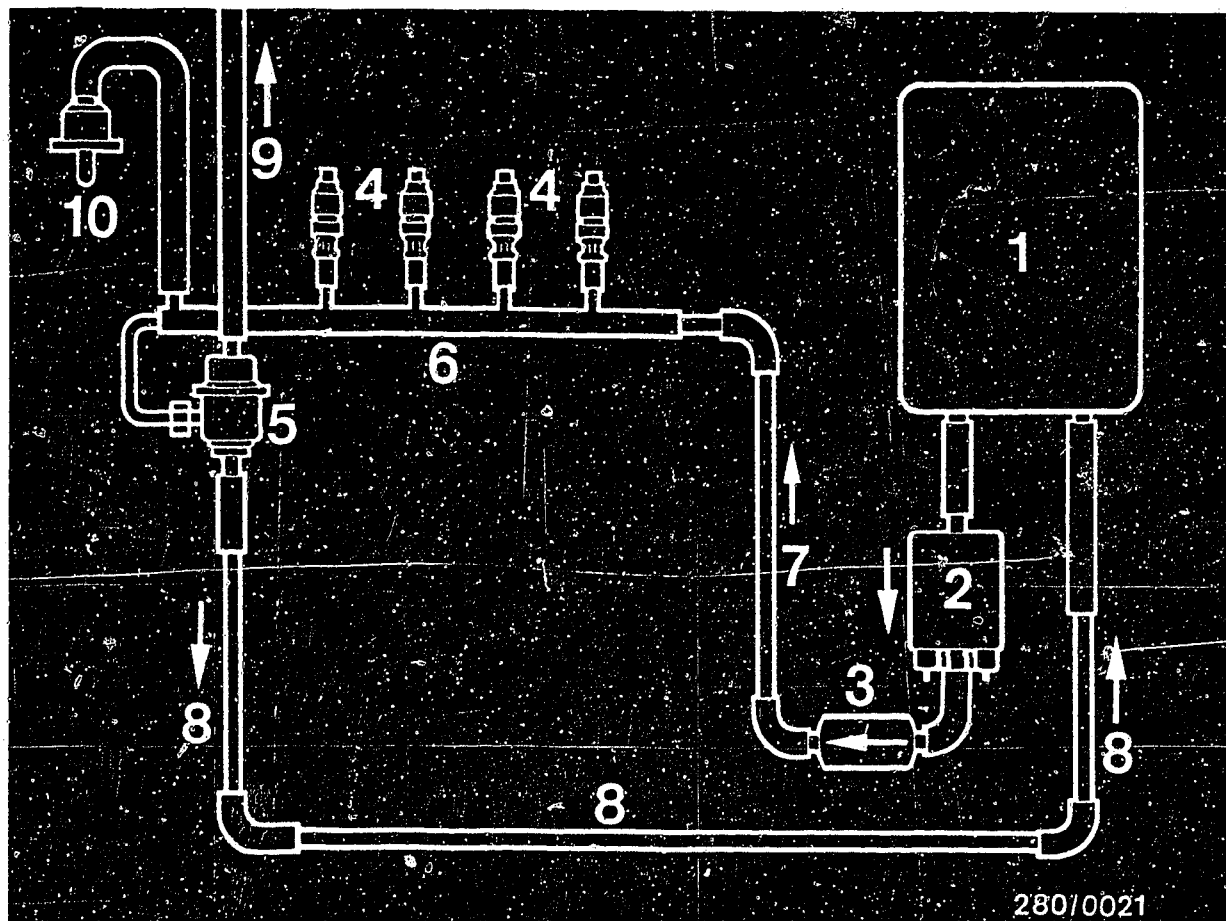
Diagram of air and fuel lines
Fiat Argenta 120 i.e.



A12

Diagram of air and fuel lines
Fiat Argenta 120 i.e.





280/0021

Diagram of fuel lines

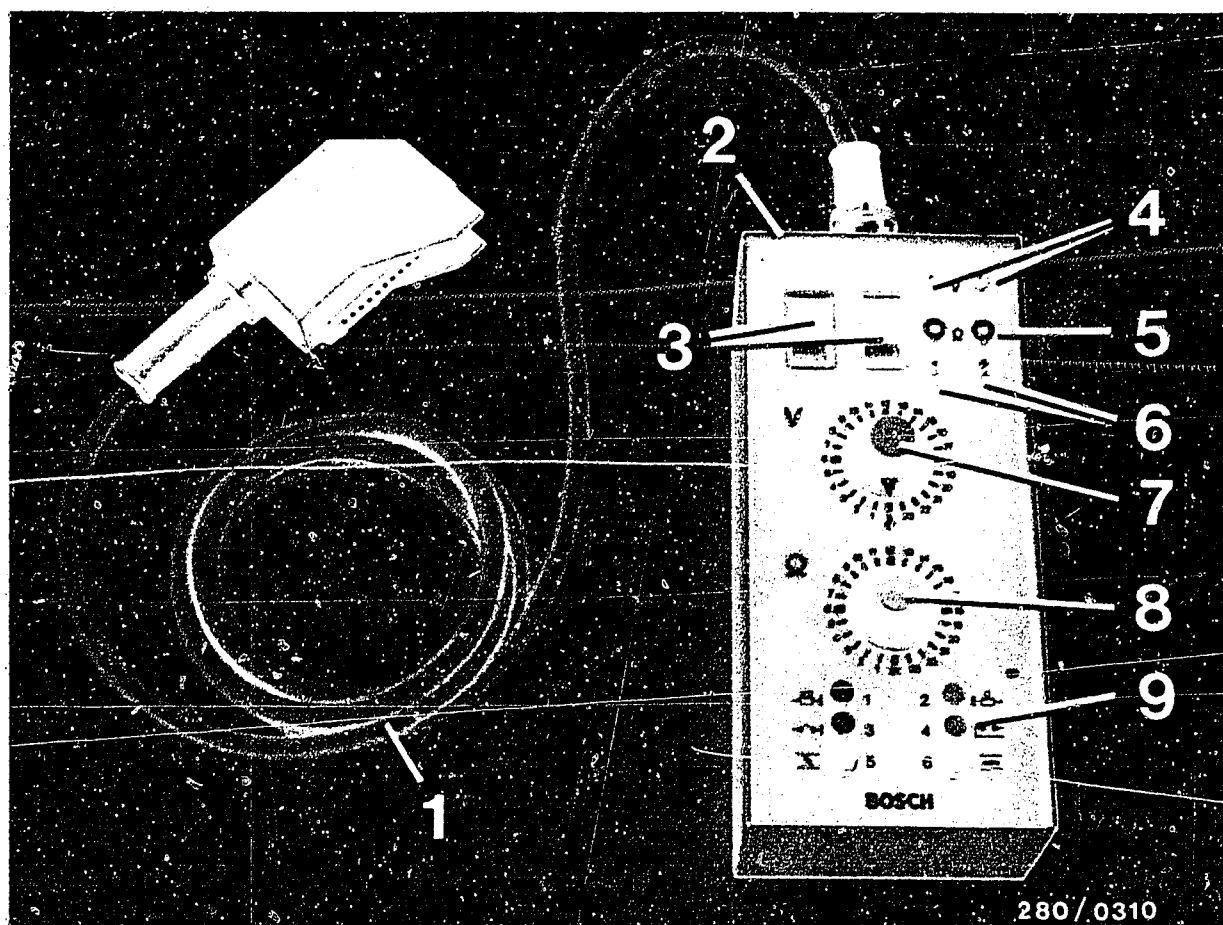
- 1 = Fuel tank
- 2 = Fuel pump
- 3 = Fuel filter
- 4 = Solenoid-operated injection valves
- 5 = Pressure regulator
- 6 = Fuel-distribution pipe
- 7 = Fuel delivery line
- 8 = Fuel return line
- 9 = To intake manifold
- 10 = Start valve



TEST EQUIPMENT AND TOOLS

<u>Description</u>	<u>Designation</u>	<u>Part No.</u>
Universal test adapter	ETT 018.01	0 684 101 801
Adapter lead		1 684 463 123
Motortester	e.g. MOT 002.00 MOT 300 MOT 400	0 684 000 200 0 684 000 300 0 684 000 400
Test lead		1 684 463 093
Exhaust-gas analyzer Calibrated analyzers	e.g. ETT 008.00 ETT 008.04 ETT 008.05	0 684 100 800 0 684 100 804 0 684 100 805
Pressure measuring instrument e.g. pressure gauge Pressure tester Pressure tester (no longer available) Three-way line	Quality class 1.0 Measuring range 6 bar 0.1 bar divisions	1 687 231 154 KDJE-P 100 KDEP 1034 KDJE-P100/13
Electrics tester or multimeter e.g.	ETE 014.00 Philips Miselco Chinaglia	0 684 101 400 PM 2517 X Master 50K Cortina
Hexagon-socket-screw key	AF 5	
Injection valve		0 280 150 214
Use suitable commercially available tools for fitting and removing the idle CO anti-tamper device on the air- flow sensor.		

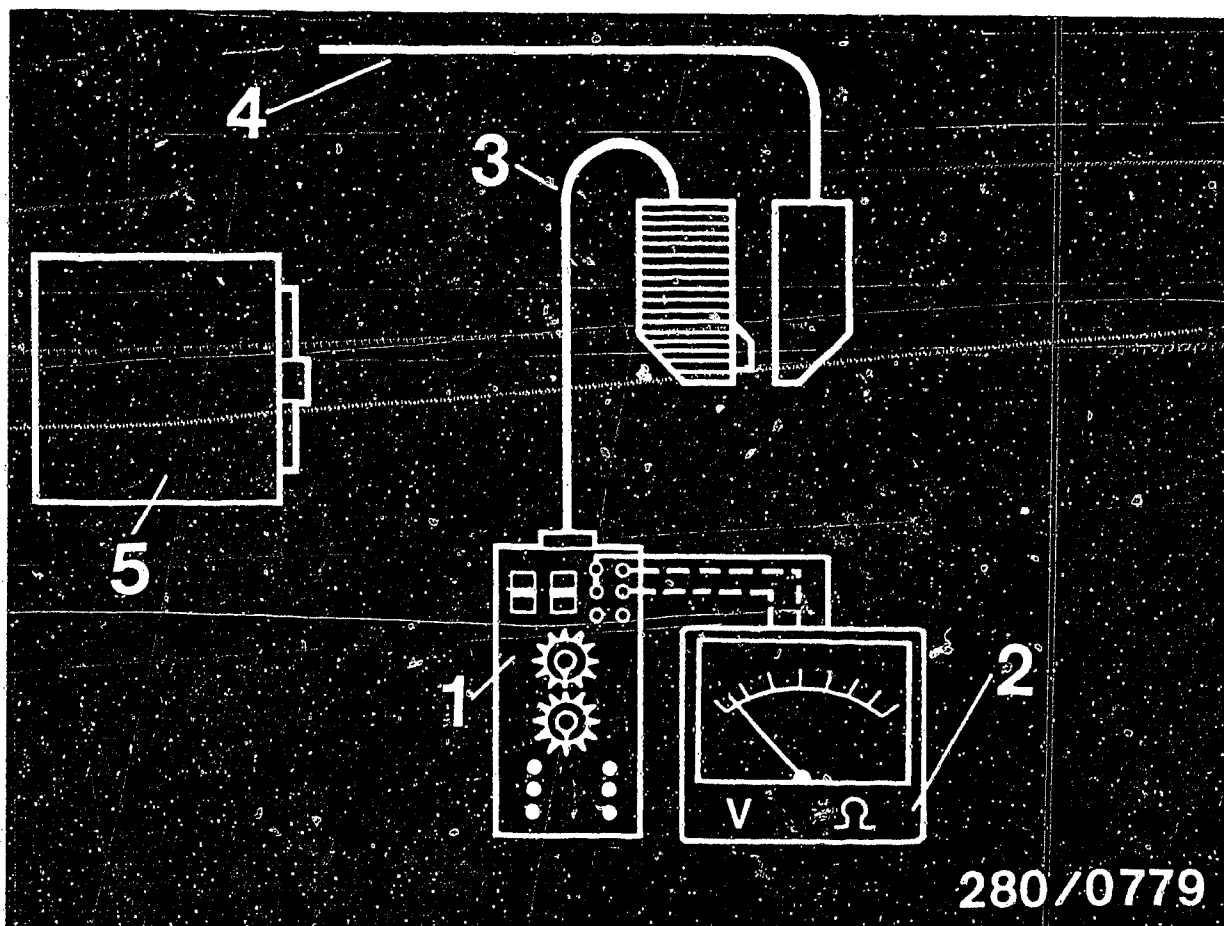




Universal Test Adapter with Adapter Lead for L-Jetronic
(Version LE 1)

- 1 = Adapter lead (part No.: 1 684 463 123)
- 2 = Universal test adapter (part No.: 0 684 101 801)
- 3 = Test wells (for motortester)
- 4 = Test sockets (for voltage measurement)
- 5 = Test sockets (for resistance measurement)
- 6 = Test sockets (not yet occupied)
- 7 = Program switch "V"
- 8 = Program switch "Ω"
- 9 = Button panel (not occupied for Version LE)





280/0779

1 = Universal test adapter

2 = Multimeter

3 = LE Adapter lead

4 = Jetronic wiring harness

5 = LE control unit

Connection:

Remove control-unit plug of Jetronic wiring harness from control unit and connect to plug of adapter lead.

Caution:

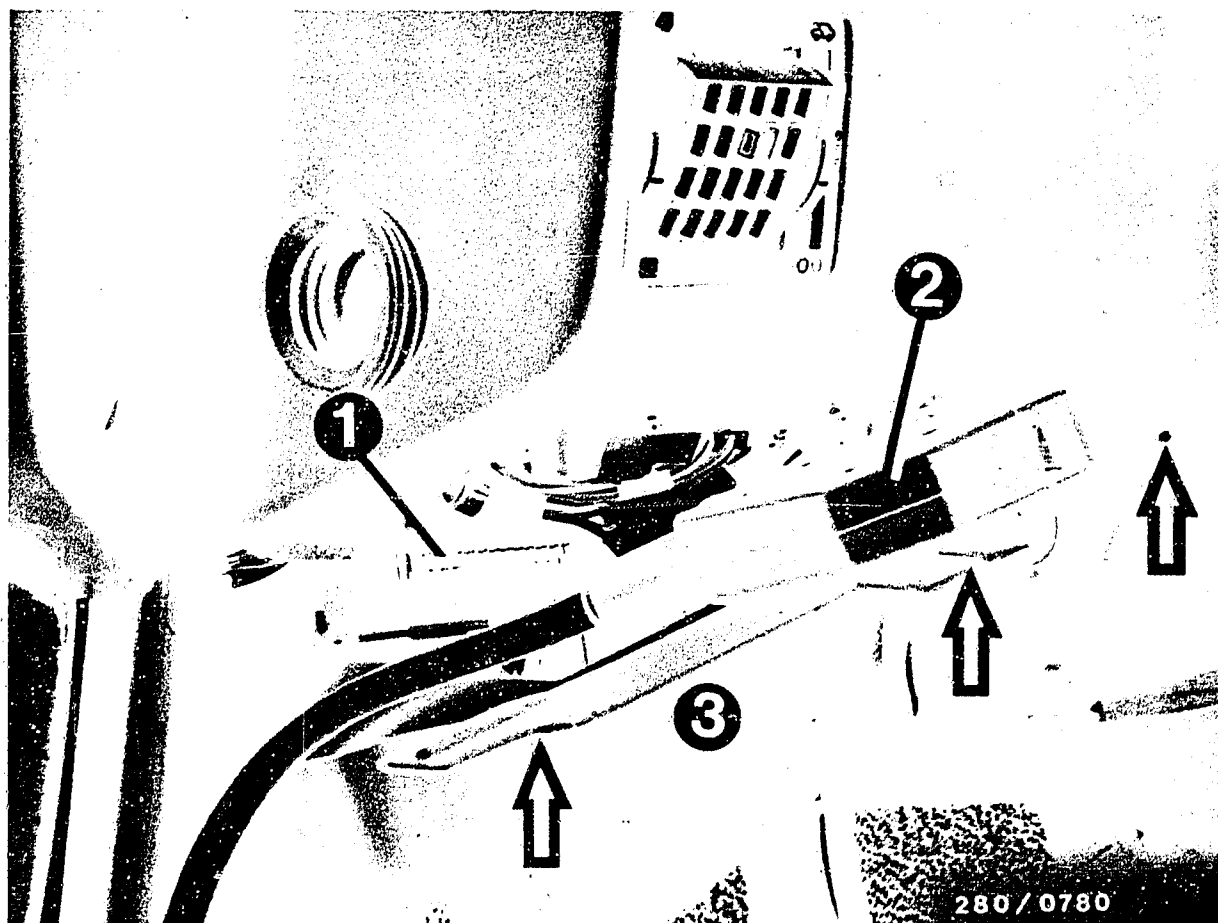
Connect and disconnect the universal test adapter only with the ignition off:

Testing:

For testing, connect a multimeter with R_i min. 20 k Ω /V to the test adapter.

It is also possible for the signal from term. 1 of the ignition coil to be measured with a motortester via the special input.





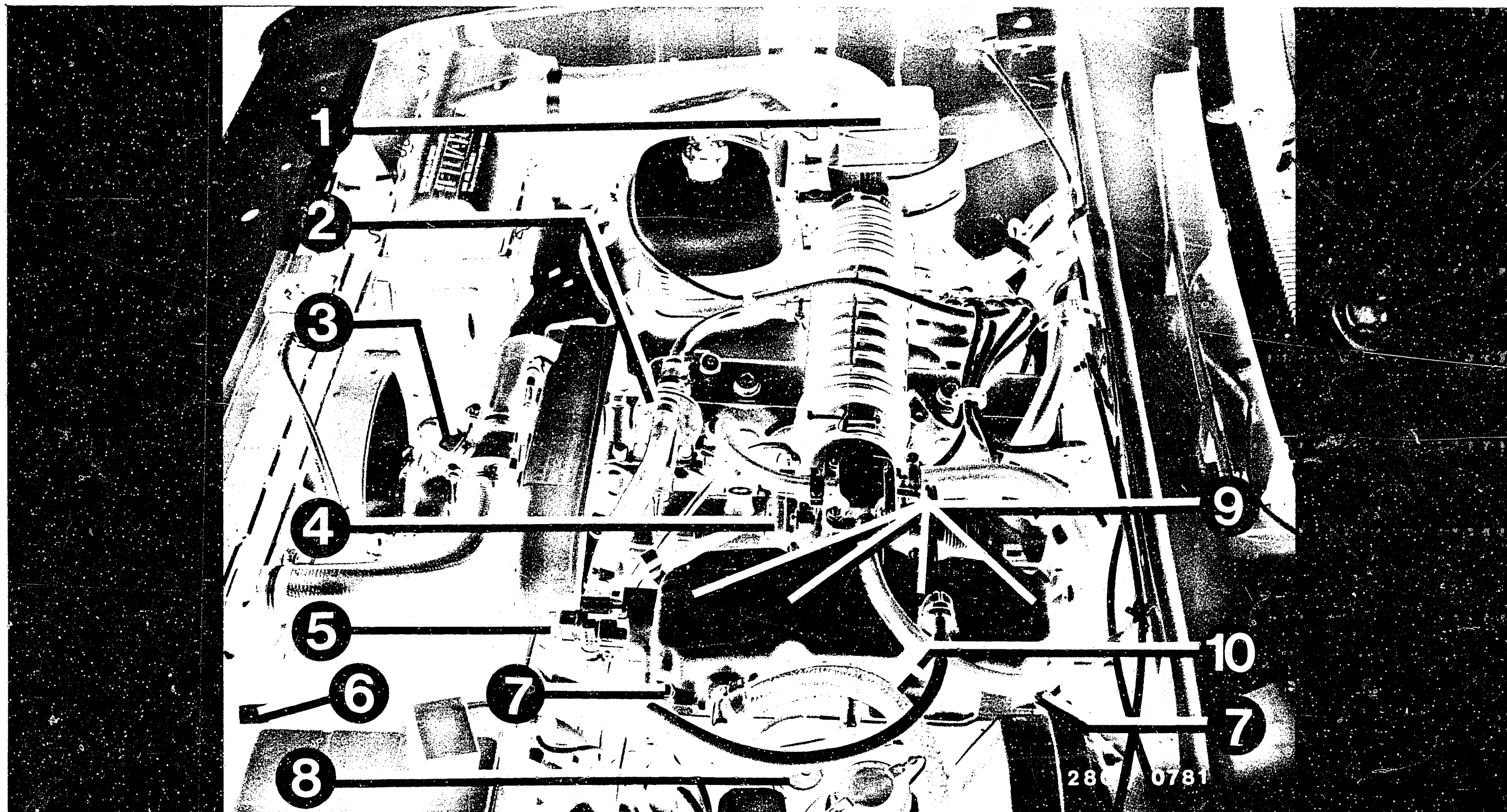
- 1 = Control unit
- 2 = LE-Adapter lead
- 3 = Control unit cover can be hinged down by loosening 3 screws (arrows).

INSTALLATION POSITION OF COMPONENTS

- Control unit in passenger compartment, driver's side to left of steering column.

To connect the universal test adapter, disconnect control-unit plug and connect plug to LE-adapter lead. The indications "left" and "right" always refer to the forward direction of travel.





Installation Position of Components (Cont/d)

1 = Air-flow sensor
2 = Auxiliary-air device
3 = Temperature sensor II (engine)

4 = Throttle valve switch
5 = Start valve
6 = Control relay

7 = Ground terminals
8 = Pressure regulator
9 = Injection valves
10 = Thermo-time switch

A18

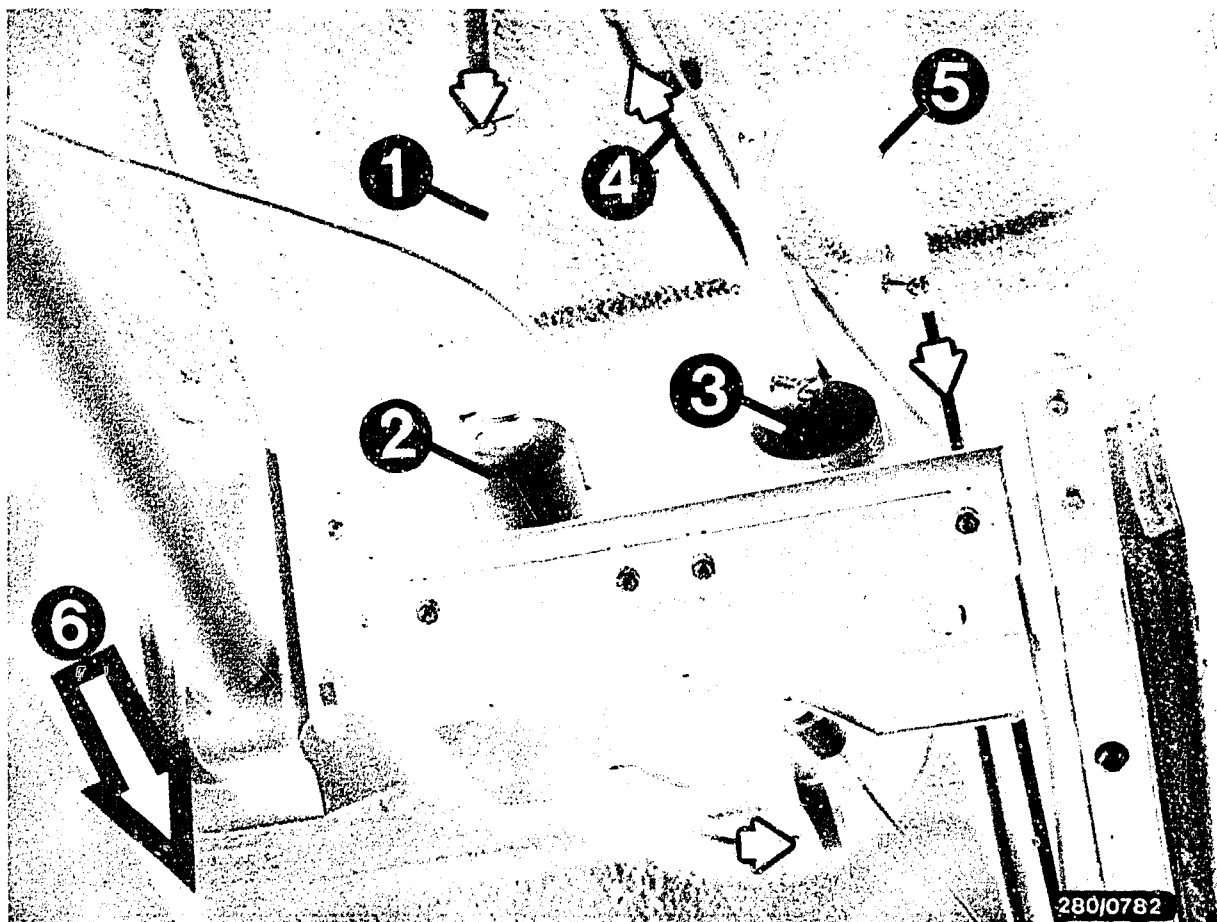
Installation position of components
Fiat Argenta 120 i.e.



A19

Installation position of components
Fiat Argenta 120 i.e.





- 1 = Fuel intake line
- 2 = Electric fuel pump
- 3 = Fuel filter
- 4 = Fuel return line
- 5 = Fuel delivery line
- 6 = Direction of travel
- arrows = Direction of fuel flow

Installation Position of Components (continued)



Installation Position of Components (continued)

Pump Fuse: In brown fuse box No. 1
In passenger compartment, front passenger
side, under glove compartment.



IMPORTANT GENERAL INFORMATION

- Never start engine without securely connected battery.
- Never use a starting aid with more than 16 V or a fast charger for starting.
- Never disconnect battery from vehicle electrical system with engine running.
- When fast charging, disconnect battery from vehicle electrical system.
- Remove control unit at temperatures above 80°C (paint-drying installation).
- Ensure that all connectors of wiring harness are secure.
- Never connect or disconnect control-unit plug with the ignition on.
- When testing compression, cut the power supply by disconnecting the control relay.
This ensures that the power supply for the LE version and therefore also for the solenoid-operated injection valves is interrupted. Undesired injecting is thus prevented.
- The LE control unit must be removed before performing electrical welding work (e.g. spot welding).
- When using the following trouble-shooting program it is assumed that the engine is in proper working order and that the ignition is correctly set. The electrical system must be checked and, if necessary, repaired.
- In order to be able to perform the test operations described in this manual and to assess the components, you should be familiar with the L-Jetronic and how it works. The essential points regarding the construction and operation of the L-Jetronic are described in Technical Instruction VDT-U3/3.
The LE version of the L-Jetronic is described in Technical Bulletin, New Product, VDT-I-280/6.
- Follow the instructions on microfiche ALL-500 if installing an alarm system.



TROUBLE-SHOOTING CHARTS

The following trouble-shooting charts are designed to enable workshop employees, using the universal test adapter with adapter lead (1 682 463 123) and other suitable test equipment, to quickly locate causes of trouble on the LE- Version. Depending on the level of knowledge and experience of the mechanic, a choice can be made between the following procedures:

- Detailed, step-by-step trouble-shooting chart
For employees with little practice or experience on vehicles equipped with LE- Version
There is a separate trouble-shooting program for each customer complaint.
- Direct, pin-pointed trouble-shooting chart
For trained, experienced employees who have had a great deal of practice on vehicles equipped with LE- Version
Trouble-shooting according to customer complaints can be started on any component within the trouble-shooting program.

Both trouble-shooting charts begin by checking the electrical/electronic part of the LE- Version with the aid of the universal test adapter with adapter lead. In this way, the wiring harness with the connected components is soon checked for proper electrical operation and faults are quickly located.

If no fault is found using the universal test adapter, it is necessary to test the fuel pressure.

If no fault is found, continue trouble-shooting with the detailed or the direct trouble-shooting chart.

B3**B5****B1**

Trouble-shooting chart

Fiat Argenta 120 i.e.

**B2**

Trouble-shooting chart

Fiat Argenta 120 i.e.



1. Detailed, step-by-step trouble-shooting chart for the complete trouble-shooting program

- Test with universal test adapter with adapter lead 1 684 463 123 and motortester or multimeter

This test must come at the beginning of the test program and must be performed from beginning to end (Coordinates B 9...C 7).



- Fuel-pressure test with pressure gauge

This test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates C 8...C 17).

- Trouble-shooting according to customer complaints (symptoms of trouble)

The table below contains possible symptoms of trouble and gives the first coordinate of the relevant detailed trouble-shooting program in the column of the right.

The trouble-shooting program consists of logically ordered test procedures for all individual components of the LE-Version. If, after completing the trouble-shooting program for an assumed trouble, the fault has not been detected or remedied, take a new symptom of the trouble and work through another program.

<u>Customer complaints (fault symptoms)</u>	<u>Electrical test with universal test adapter</u>	<u>Fuel pressure test with pressure gauge</u>	<u>Trouble-shooting program</u>
1. Starting motor operates, engine fails to start or starts only with great difficulty	B 9	C 8	C 18
2. Engine starts but then dies	B 9	C 8	D 15
3. Uneven idle/incorrect idle speed	B 9	C 8	E 1
4. Poor throttle take-up	B 9	C 8	F 5
5. Engine missing under all operating conditions	B 9	C 8	G 1
6. Fuel consumption too high	B 9	C 8	H 3
7. Maximum engine power/top speed not reached	B 9	C 8	H 17
8. Idle speed and CO concentration too low or too high	B 9	C 8	J 7
B3 Trouble-shooting chart Fiat Argenta 120 i.e.			B4 Trouble-shooting chart Fiat Argenta 120 i.e. 

2. Pin-pointed direct trouble-shooting

• Electrical test with universal test adapter with adapter lead 1 684 463 123 and motortester or multimeter

The test with the universal test adapter must come at the beginning of the test program and must be performed from beginning to end (Coordinates B 9...C 7).

• Fuel pressure test with pressure gauge

The fuel pressure test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates C 8...C 17).

• Trouble-shooting according to customer complaints

The table below contains various symptoms of trouble with several possible causes of the trouble in each case. The coordinate reference field indicates the first coordinate of the test procedure for the respective LE-Jetronic component. If, after testing the individual components, the fault has not been detected or remedied, choose a new symptom of the trouble.

Customer complaints (fault symptoms)

1. Starting motor operates, engine fails to start or starts only with great difficulty

2. Engine starts but then dies

3. Uneven idle/incorrect idle speed

4. Poor throttle take-up

5. Engine missing under all operating conditions

6. Fuel consumption too high

7. Maximum engine power/top speed not reached

8. Idle speed and CO concentration too low or too high

Cause (component fault)

B9	B9	B9	B9	B9	B9	B9	B9	Fault in electrics. Test with universal test adapter
C8	C8	C8	C8	C8	C8	C8	C8	Fault in fuel supply. Pressure regulator defective. Control relay defective. Electric fuel pump not operating. Fuel pressure test.
D3	D19		F9					Auxiliary-air device not opening
		E7					J13	Auxiliary-air device not closing
D5		E21	F11	G5	H13	J1	J11	Air-flow sensor defective, potentiometer test (noise test)
D7								Hot-starting difficulties - air-intake system or fuel system leaking

B5

Trouble-shooting chart

Fiat Argenta 120 i.e.



B6

Trouble-shooting chart

Fiat Argenta 120 i.e.



Customer complaints (fault symptoms)

1. Starting motor operates, engine fails to start or starts only with great difficulty
 2. Engine starts but then dies
 3. Uneven idle/incorrect idle speed
 4. Poor throttle take-up
 5. Engine missing under all operating conditions
 6. Fuel consumption too high
 7. Maximum engine power/top speed not reached
 8. Idle speed and CO concentration too low or too high
- Cause (component fault)

				G3				Voltage peaks, ground contact
D11	D21	F1	F19			J3	J23	Air-intake system leaking
		E13		G19	H7		J17	Injection valves defective; connect test lead, repair, leaks
				G12		H23		Insufficient fuel delivery of electric fuel pump
		E3	F7					Throttle valve not closing (test overrun cutoff)
						H19		Throttle valve not opening fully
		E3				H21		Throttle-valve switch defective (adjustment)
		E5	F17	G17	H15		J9	CO exhaust gas setting too rich, idle adjustment
		E5	F17	G17			J9	CO exhaust gas setting too lean, idle adjustment, burbling
				G13		H21		Control unit defective
D1		E11						Thermo-time switch defective
C20								Start valve defective
	D17	E9			H5		J15	Start valve (leaks)
				G17				Hot delivery problems
D5								Burbling during starting (after-sales service solution)

B7

Trouble-shooting chart

Fiat Argenta 120 i.e.



B8

Trouble-shooting chart

Fiat Argenta 120 i.e.



TEST CHART FOR UNIVERSAL TEST ADAPTER
with connected adapter lead 1 684 463 123 for LE version

- Before testing with the universal test adapter, check all multiple plug connectors for loose contacts.
Clean contacts if dirty or corroded.
- Watch for blade receptacles which have been pushed back.
If necessary, bend back the latching lug and press the blade receptacle as far as it will go into the plug housing; latching lug locks into position.
- Suspicion of line breaks in case of kinking and pinching.

The universal test adapter tests only the peripherals of the electrics (without control unit).

Remove control-unit plug of Jetronic wiring harness from control unit and connect to plug of adapter lead (ignition must be off).

To make measurements, connect a multimeter to the universal test adapter for measuring voltage and resistance, as well as a motortester.

The individual test steps are selected by means of two program switches (one for voltage measurements and the other for resistance measurements). Each program switch has 24 test positions. However, only some of these are occupied for the LE-version.

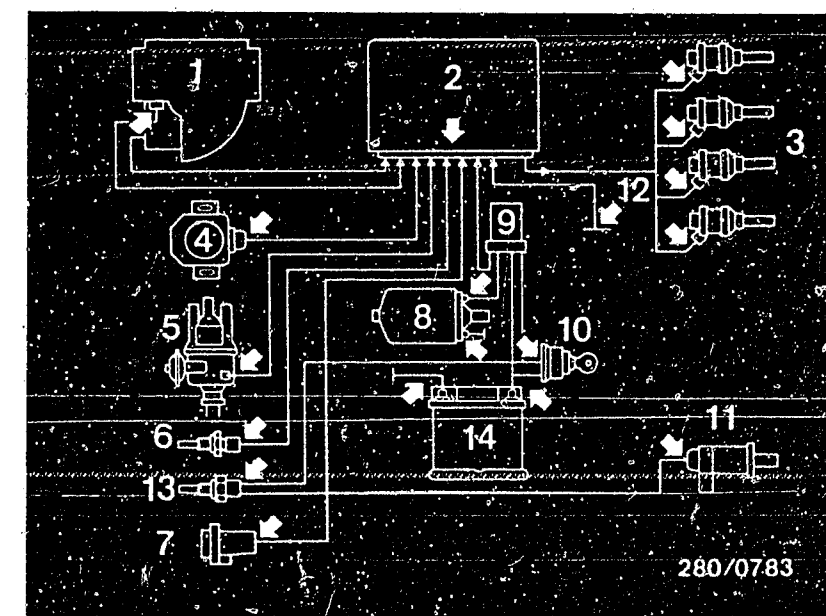
If a fault is found during a test, the test must be repeated after remedying the fault.

The test with the universal test adapter must always be performed from beginning to end.

Be sure to follow the instructions in the test chart.

- Test steps 1...3 measure voltages during starting.
Set multimeter to "voltage measuring range".
- Test steps 4...10 measure resistances.
Set multimeter to "resistance measuring range".

Test specifications and notes on how to operate the universal test adapter are given in the following test chart.



Electrical plug-in connections
 (arrows)

- 1 = Air-flow sensor
- 2 = Control unit
- 3 = Injection valves
- 4 = Throttle-valve switch
- 5 = Ignition distributor
- 6 = Temperature sensor (engine)
- 7 = Auxiliary-air device
- 8 = Electric fuel pump
- 9 = Control relay
- 10 = Ignition lock
- 11 = Start valve
- 12 = Central ground
- 13 = Thermo-time switch
- 14 = Battery

B9

Test chart for universal test adapter
 Fiat Argenta 120 i.e.



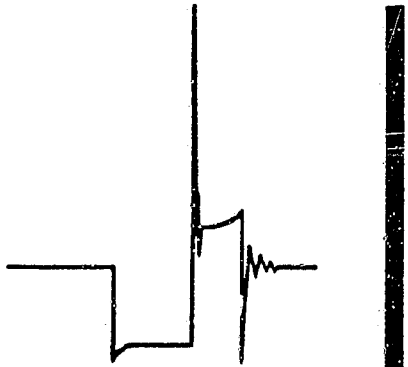
B10

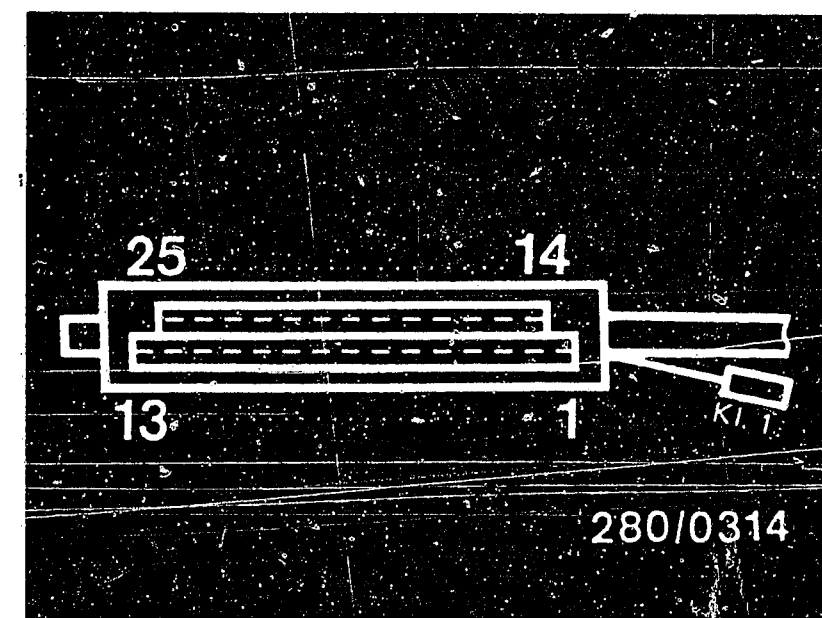
Test chart for universal test adapter
 Fiat Argenta 120 i.e.



Note:

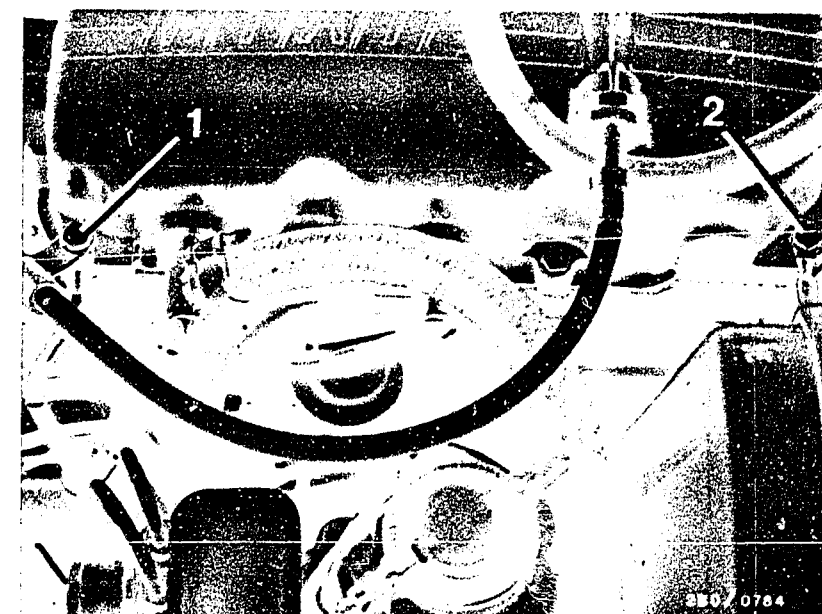
In the following test steps a white surround in the "Operation" column indicates which operation is different from the preceding test step.

TEST STEP: 1			
Operation		Reading	Testing
Program switch "V" at position:	5	<p>Primary Signal Present</p>  <p>Yes</p> <p>No</p>	<u>Component:</u> Ignition system signal from term. 1
Program switch "Ω" at position:	-*		
Measuring equipment: ignition oscilloscope			<u>Operation:</u> Voltage pulses energization of control unit by the ignition
Measuring range: Special input . Control stick up against left-hand stop and measuring range 20V			<u>Malfunction:</u> No reading
Connection: Testwells			
Operation in vehicle: Ignition "ON" and operate starting motor		Continue testing with <u>next test step.</u>	



Top view of control-unit plug

1=Output stage ground terminal
2=Electrics ground terminal



Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value 0 Ω)

- From control-unit plug term. 1 to ignition coil term. 1.
- From control unit plug term. 5 to electronics ground terminal.
- Eliminate contact resistances in the plug-in connections.

If ignition pulse still not visible - test ignition system.

* Switch position not specified.

B11

Test chart for universal test adapter
Fiat Argenta 120 i.e.

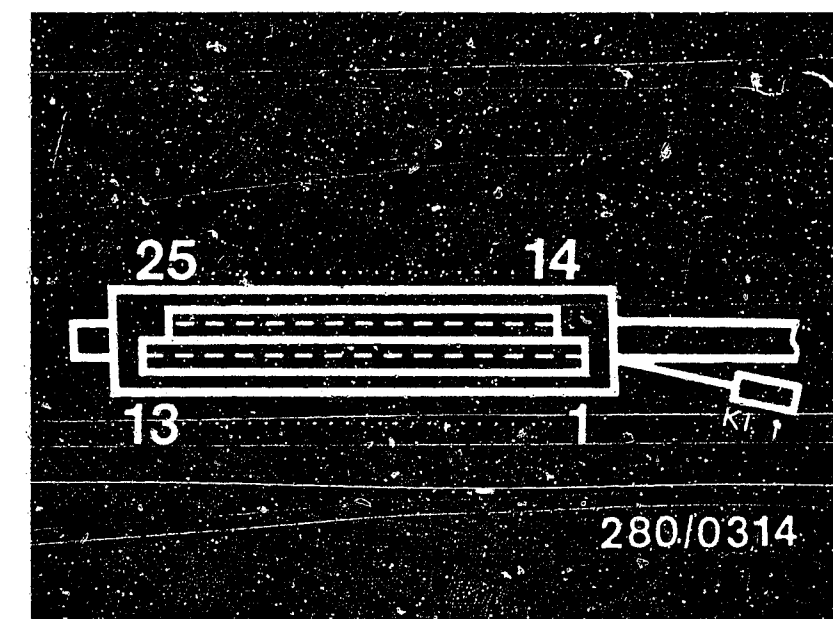


B12

Test chart for universal test adapter
Fiat Argenta 120 i.e.



TEST STEP: 2			
Operation		Reading	Testing
Program switch "V" at position:	6	Measuring equipment must indicate. 8 ... 15 V	Component: Control relay, voltage supply
Program switch "Ω" at position:	-		
Measuring equipment: motor-tester or multimeter (V range)		<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Yes</p> <p>↓</p> </div> <div style="text-align: center;"> <p>No</p> <p>↓</p> </div> </div>	Operation: Voltage supply from term. 87 Malfunction: No voltage reading
Measuring range: 0...15 V			
Connection: test socket red (+) test socket black (-)			
Operation in vehicle: Ignition "ON" and operate starting motor			
		Continue testing with next test step.	



Top view of control-unit plug

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0 Ω):

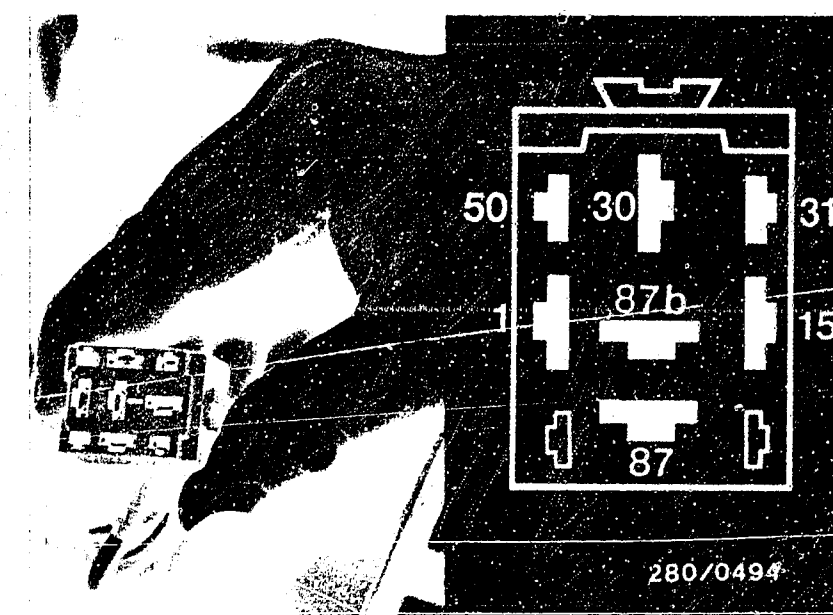
• From control-unit plug term. 9 to control relay term. 87.
Disconnect battery for further testing.

- From control relay term. 30 to battery (positive terminal).
 - From control relay term. 15 to ignition term. 15.
 - From control relay term. 50 to starting motor term. 50.
 - From control relay term. 31 to electronics ground terminal.
 - Eliminate contact resistances at the plug-in connections.
- If still no voltage reading - replace control relay.

Installation position of components:

- Control relay: In engine compartment on left between battery and headlamp.
- Electronics ground terminal: On intake manifold under fastening screw near cylinder 4.

similar to Fiat Argenta 120 i.e.
Control relay disconnected
Top view of plug



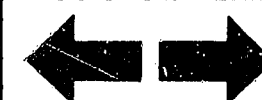
B 13

Test chart for universal test adapter
Fiat Argenta 120 i.e.



B 14

Test chart for universal test adapter
Fiat Argenta 120 i.e.



TEST STEP: 3			
Operation		Reading	Testing
Program switch "V" at position:	7	Measuring equipment must indicate 5 ... 10 V	Component: Control relay, starting motor K1.50
Program switch "Ω" at position:	-		
Measuring equipment: motor-tester or multimeter (V range)		<div> <div>Yes</div> <div>No</div> </div>	<div>Operation:</div> <div>Starting signal</div> <div>Malfunction:</div> <div>No voltage reading</div>
Measuring range: 0...15 V			
Connection: test socket red (+) test socket black (-)			
Operation in vehicle: Ignition "ON" and operate starting motor			
		Continue testing with next test step.	

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

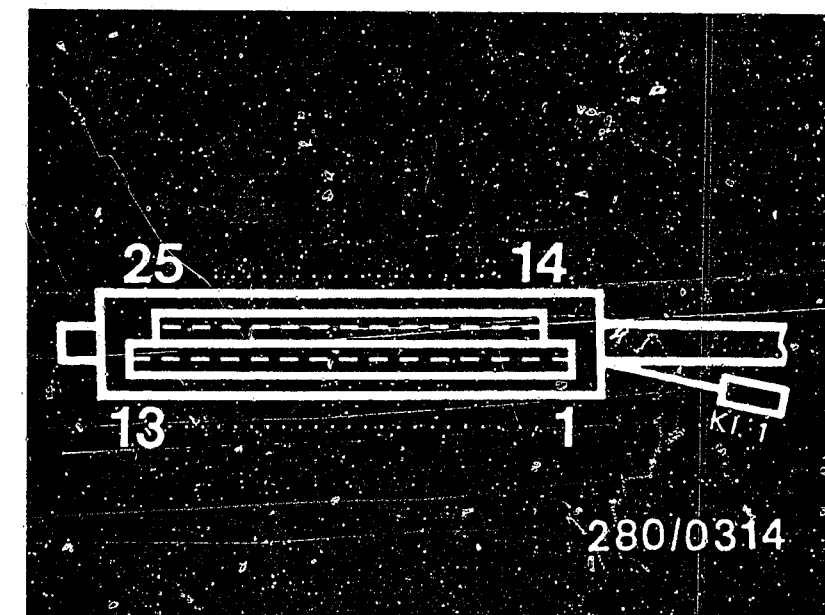
Using ohmmeter, test the following leads for continuity (set value 0 Ω)

- From control-unit plug term. 4 to control relay term. 50.
- Eliminate contact resistances at the plug-in connections.

If still no voltage reading - test starting control.

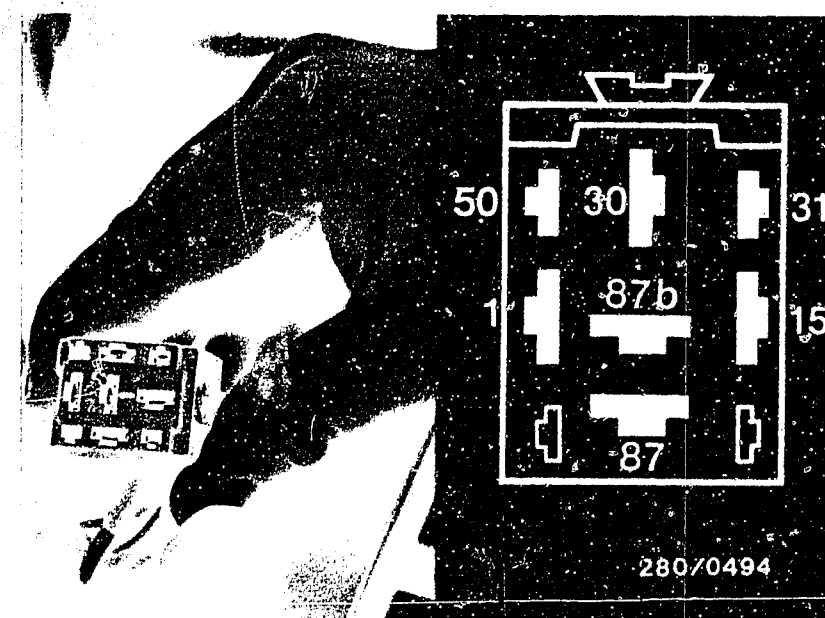
Installation position of components:

- Control relay: In engine compartment on left between battery and headlamp.

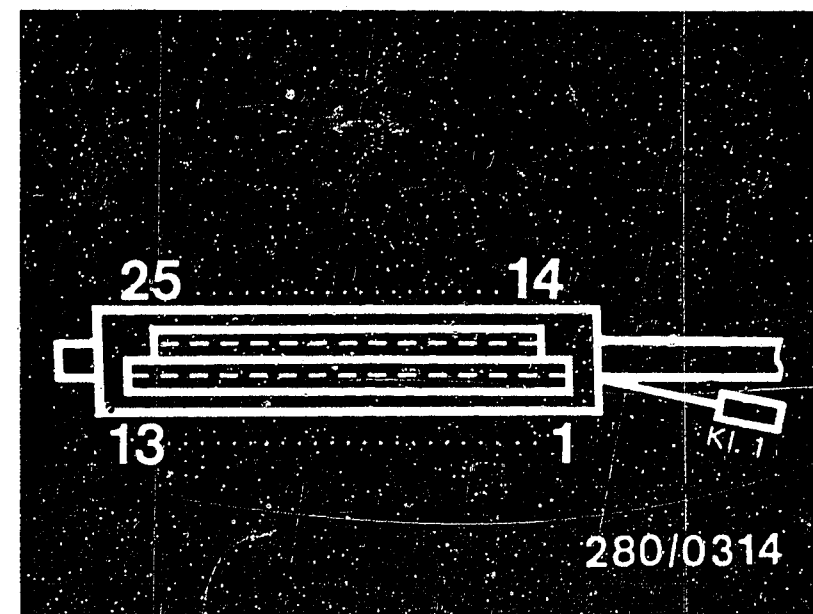


Top view of control-unit plug

similar to Fiat Argenta 120 i.e.
Control relay disconnected
Top view of plug



TEST STEP: 4		
Operation	Reading	Testing
Program switch "V" at position:	<div> <div>Measuring equipment must indicate</div> <div>100 ... 200 Ω</div> </div>	<div>Component:</div> <div>Air-flow sensor (temperature sensor I)</div>
Program switch "Ω" at position:		
Measuring equipment: motor-tester or multimeter (Ω - range)	<div> <div>Yes</div> <div>No</div> </div>	<div>Operation:</div> <div>Resistance between control unit plug term. 8 and electronics ground terminal.</div>
Measuring range: x 10 Ω		
Connection: Test sockets blue		
Operation in vehicle: ---		
	Continue testing with next test step.	Malfunction: Resistance outside tolerance



Top view of control-unit plug

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value 0 Ω)

1. Electric fuel pump:

- From control relay term. 87b through pump fuse to electric fuel pump (positive terminal).
- From electric fuel pump (negative terminal) to ground terminal on body

2. Air-flow sensor

- From multiple plug term. 8 to air-flow sensor term. 8.
- From air-flow sensor term. 5 to electronics ground terminal.
- From air-flow sensor term. 9 to control-unit plug term. 9.

Eliminate contact resistances in plug-in connections.

If resistance reading still outside tolerance - replace air-flow sensor.

Installation Pos. of Components

- Electric fuel pump:
Under vehicle on left after rear axle.
- Air-flow sensor:
In engine compartment on right.
- Electronics ground terminal:
On intake manifold under fastening screw near cylinder 4.
- Pump fuse:
In central fuse box (brown) under glove compartment.

B 17

Test chart for universal test adapter
Fiat Argenta 120 i.e.

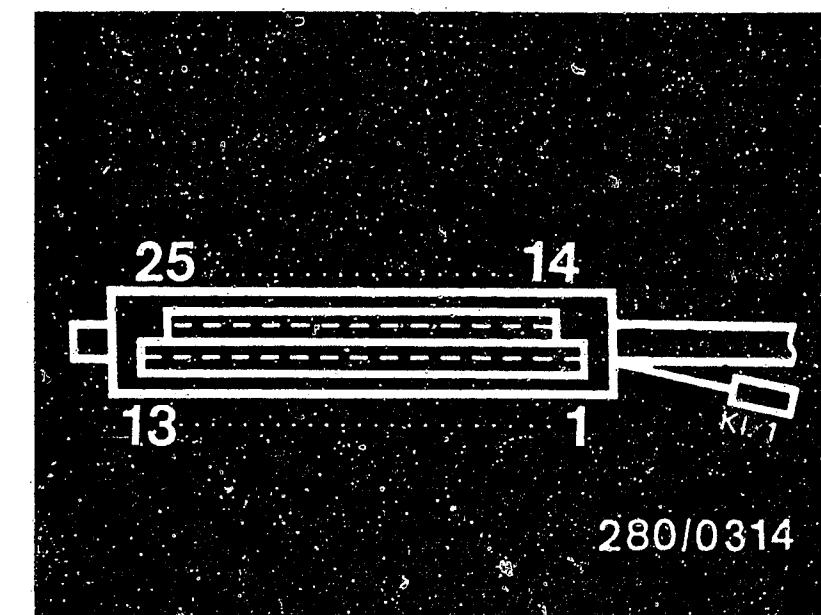


B 18

Test chart for universal test adapter
Fiat Argenta 120 i.e.



TEST STEP: 6			
Operation		Reading	Testing
Program switch "V" at position:	↓	Measuring equipment must indicate at ambient temperature (+15°C...+30°C): <u>1.3 ... 3.6 kΩ</u> <u>250...390 Ω</u> with engine at normal op. temp. (approx. +80°C).	Component: Temperature sensor II (engine)
Program switch "Ω" at position:	13		
Measuring equipment: motor-tester or multimeter (Ω - range)			Operation: Resistance between control unit plug term. 10 and electronics ground terminal.
Measuring range: x 10 Ω or x 100 Ω			
Connection: Test sockets blue		Yes ↓ Continue testing with next test step.	Malfunction: Resistance outside tolerance
Operation in vehicle: ---		No ↓	



Top view of control-unit plug

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Measure resistance directly at temperature sensor II, engine (white plug)

If the measured resistance is outside tolerance - replace temperature sensor.

Using ohmmeter, test the following leads for continuity (set value 0 Ω)

- From control-unit plug term 10 to temperature sensor II (engine) term. 10
- Lead 38 from temperature sensor II to electronics ground terminal.
- Eliminate contact resistances in the plug-in connections.

Installation Pos. of Components

- Temperature sensor II:
In coolant circuit (near fan) (white plug).
- Electronic ground terminal:
On intake manifold under fastening screw near cylinder 4.

B21

Test chart for universal test adapter
Fiat Argenta 120 i.e.



B22

Test chart for universal test adapter
Fiat Argenta 120 i.e.

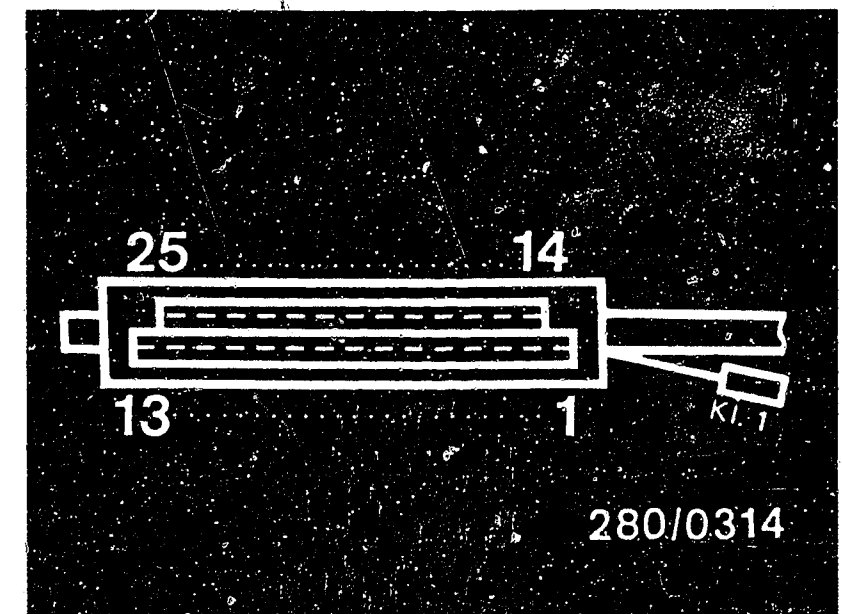


TEST STEP: 7		
Operation	Reading	Testing
Program switch "V" at position:	<div> <div>Measuring equipment must indicate</div> <div>0 ... 10 Ω</div> </div>	<div>Component:</div> <div>Ground connection of output stage</div>
Program switch " Ω " at position:		
Measuring equipment: motor-tester or multimeter (Ω - range)	<div> <div>Yes</div> <div>No</div> </div>	<div>Operation:</div> <div>Ground connection of control unit term. 13</div>
Measuring range: x 1 Ω		
Connection: Test sockets blue		
Operation in vehicle: ---		
	Continue testing with next test step.	<div>Malfunction:</div> <div>Resistance outside tolerance</div>

Trouble-shooting:
For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value 0 Ω)

- From control-unit plug term. 13 to output stage ground terminal.
- Eliminate contact resistances in the plug-in connections.

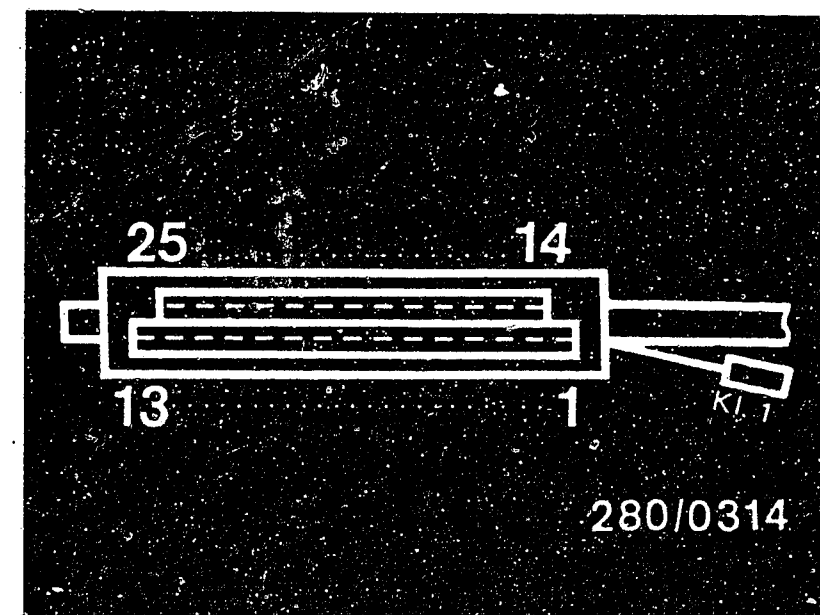


Top view of control-unit plug

2 = Output stage ground terminal



TEST STEP: 8		
Operation		Reading
Program switch "V" at position:	↓	Measuring equipment must indicate: <u>0 ... 10 Ω</u>
Program switch "N" at position:	16	
Measuring equipment: motor-tester or multimeter (Ω - range)		<div> <div>Yes</div> <div>↓</div> <div>Continue testing with next test step.</div> </div> <div>No</div>
Measuring range: x 1 Ω		
Connection: Test sockets blue		
Operation in vehicle: Accelerator in rest position		
		<div> <div>Operation:</div> <div>Resistance between control unit plug term. 2 and term. 9</div> </div> <div> <div>Malfunction:</div> <div>Resistance outside tolerance</div> </div>



Top view of control-unit plug

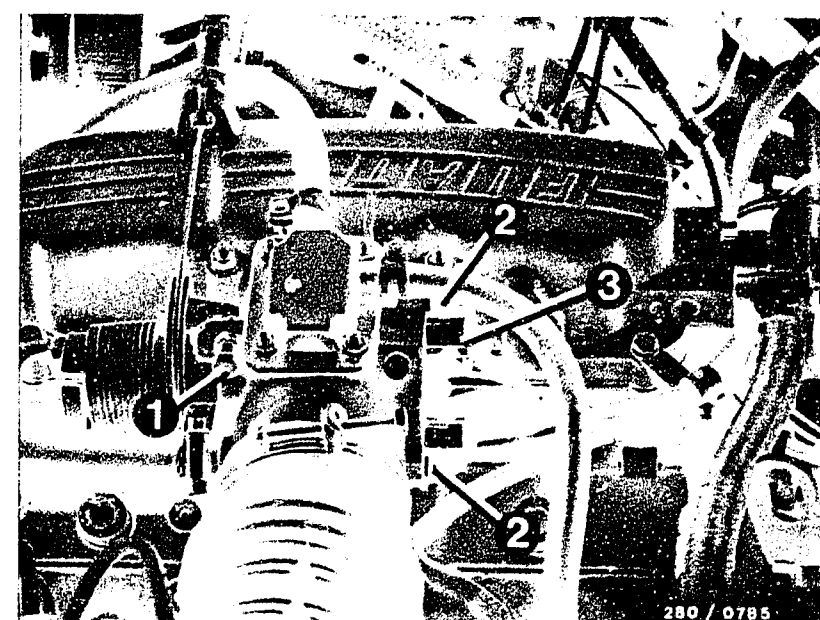
- 1 = Throttle-valve stop screw
2 = Fastening screws
3 = Throttle-valve switch

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Adjusting the throttle-valve switch (on intake manifold on right)
Slightly loosen throttle-valve switch fastening screws. Connect ohmmeter to throttle-valve switch between term. 2 and lead 9 (term.18). Turn throttle-valve switch in a counterclockwise direction right the idle contact closes (microswitch can be heard to click). Reading 0 Ω . If not, replace throttle-valve switch.
Checking the adjustment: pull slightly on throttle cable. The idle contact opens (microswitch can be heard to click). Reading $\infty \Omega$.
Using ohmmeter, test the following leads for continuity (set value approx. 0 Ω):

- From control-unit plug term. 2 to throttle-valve switch term. 2.
- From throttle-valve switch lead 9 (term. 18) to control-unit plug term. 9.
- Eliminate contact resistances in the plug-in connections.



C1

Test chart for universal test adapter
Fiat Argenta 120 i.e.

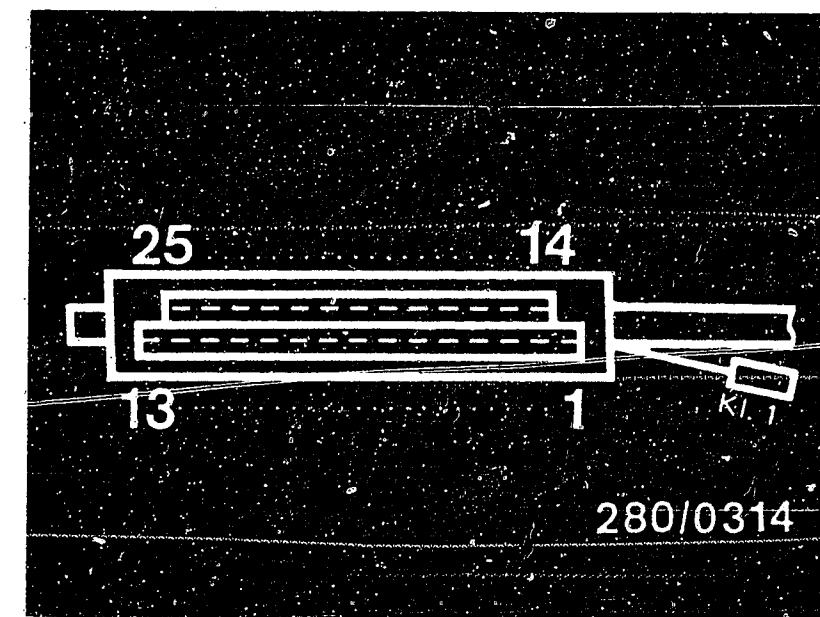


C2

Test chart for universal test adapter
Fiat Argenta 120 i.e.

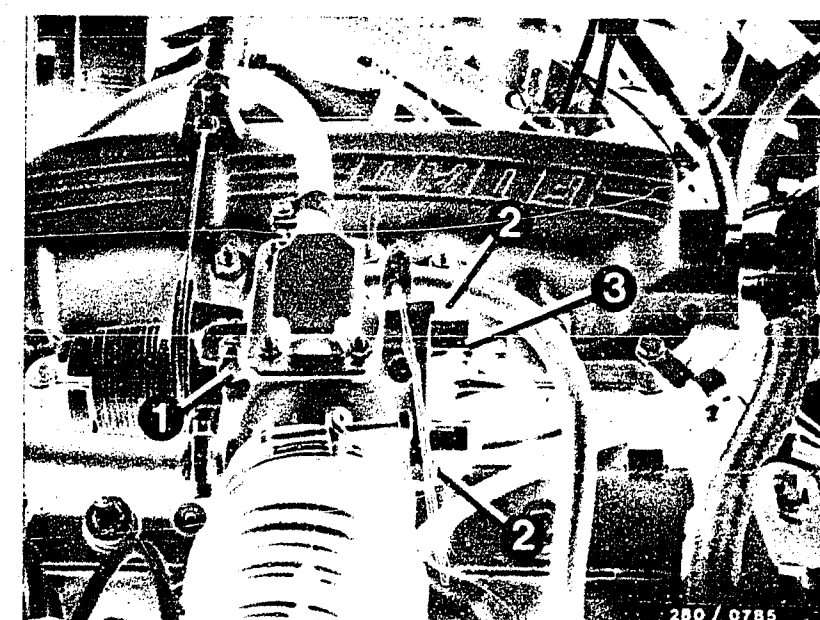


TEST STEP: 9			
Operation		Reading	Testing
Program switch "V" at position:	↓	Measuring equipment must indicate: <u>0 ... 10 Ω</u>	Component: Throttle-valve switch (Full-load contact)
Program switch "Q" at position:	17		
Measuring equipment: motor-tester or multimeter (Ω - range)		<div>Yes</div> <div>No</div>	Operation: Resistance between control unit plug term. 3 and term. 9 Malfunction: Resistance outside tolerance
Measuring range: x 1 Ω			
Connection: Test sockets blue			
Operation in vehicle: Accelerator in full-load position			
		Continue testing with next test step.	



Top view of control-unit plug

3 = Throttle-valve switch



Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

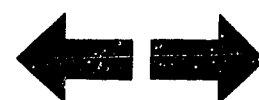
Using ohmmeter, test the following leads for continuity (set value 0 Ω)

- From control-unit plug term. 3 to throttle-valve switch term. 3
- Eliminate contact resistances in the plug-in connections.

If the resistance reading is still outside tolerance - replace throttle-valve switch.

C3

Test chart for universal test adapter
Fiat Argenta 120 i.e.



C4

Test chart for universal test adapter
Fiat Argenta 120 i.e.



TEST STEP: 10		
Operation	Reading	Testing
Program switch "V" at position:	Measuring equipment must indicate + 20°:	Component: Injection valves 1, 2, 3 and 4
Program switch "Ω" at position: 18	7,0 ... 9,5 Ω	
Measuring equipment: motor-tester or multimeter (Ω - range)	+ 80°C:	Operation: Resistance at control unit plug between term. 12 and term. 9
Measuring range: x 1 Ω	7,2 ... 10,0 Ω	
Connection: Test sockets blue	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Yes</p> <p>↓</p> <p>Continue testing with next test step.</p> </div> <div style="text-align: center;"> <p>No</p> <p>↓</p> </div> </div>	Malfunction: Resistance outside tolerance
Operation in vehicle: ---		

Trouble-shooting:

For testing, remove control-unit plug from test adapter and use circuit diagram if necessary.

Using ohmmeter, test the following leads for continuity (set value approx. 0 Ω):

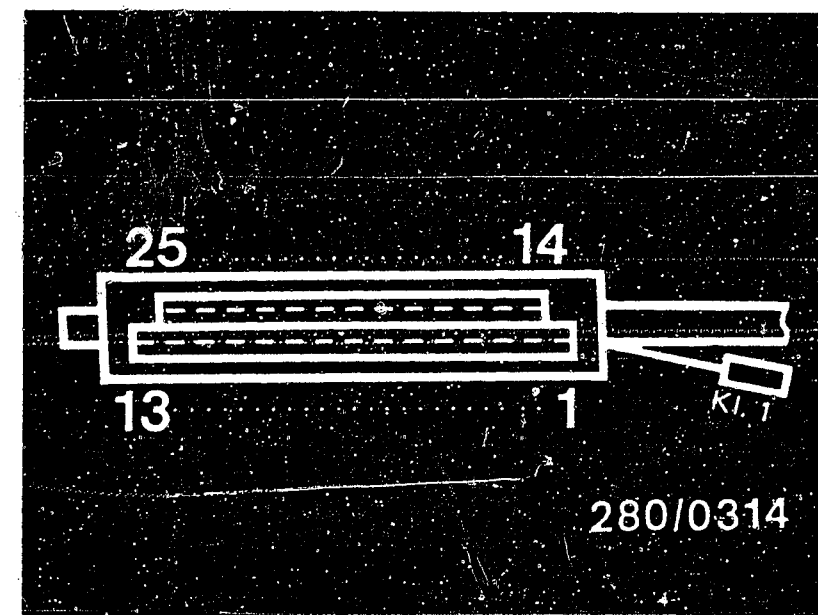
- From control-unit plug term. 12 to the injection valves.
- From the injection valves to control relay term. 87.
- Resistance measurement at injection valve:
at ambient temperature (+15°C...+30°C): 15...17.5 Ω
with engine at op. temp. (approx.+80°C): 17...20 Ω

If reading too high: valve coil has open circuit or a valve connector has dropped off. Check connection lugs for security. Eliminate contact resistances.

If necessary, replace injection valve(s).

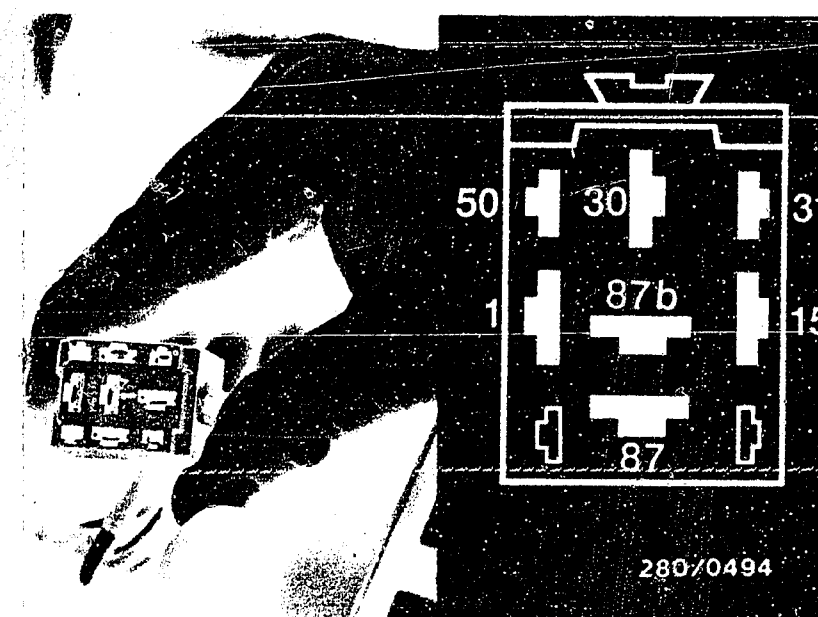
Installation position of components

- Injection valves: In intake ports under intake manifold.
- Control relay: In engine compartment on left between battery and headlamp.



Top view of control-unit plug

similar to Fiat Argenta 120 i.e.
Control relay disconnected
Top view of plug



C5

Test chart for universal adapter
Fiat Argenta 120 i.e.



C6

Test chart for universal adapter
Fiat Argenta 120 i.e.



The electrical test with the universal test adapter is now completed.

The fuel pressure test must now be performed.

The fuel pressure test is described on Coordinates C 8...C 17.

C7

Test chart for universal test adapter
Fiat Argenta 120 i.e.



FUEL PRESSURE TEST

Electric fuel pump operating?
(listen)

- Lead from ignition coil term.1 O.K.?
- Voltage at term.87b and electric fuel pump?
- Pump fuse O.K.?
- Ground lead O.K.?

no

Test control relay

With the connection base turned round with the control relay connected:

- Test lead from term. 1 to ignition coil term. 1 for continuity (approx. 0Ω). Start engine.
- If no voltage at term. 87b, replace control relay.
- Pump fuse, on right under glove compartment, in brown fuse box, O.K.? If not - replace.
- Voltage at terminals of electric fuel pump min. 12 V.
If not, test ground lead.
If yes, replace electric fuel pump.

yes

Fuel pressure O.K.?

- Test specification:
2.8...3.2 bar

Test specification reached?

no

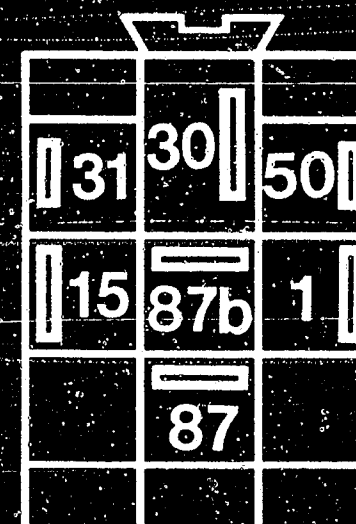
Test fuel pressure

- Connect pressure gauge or pressure tester. Disconnect hose of delivery line from fuel-distribution pipe.

Caution: when removing the fuel hose, make sure that no fuel gets onto hot parts of the engine.

yes

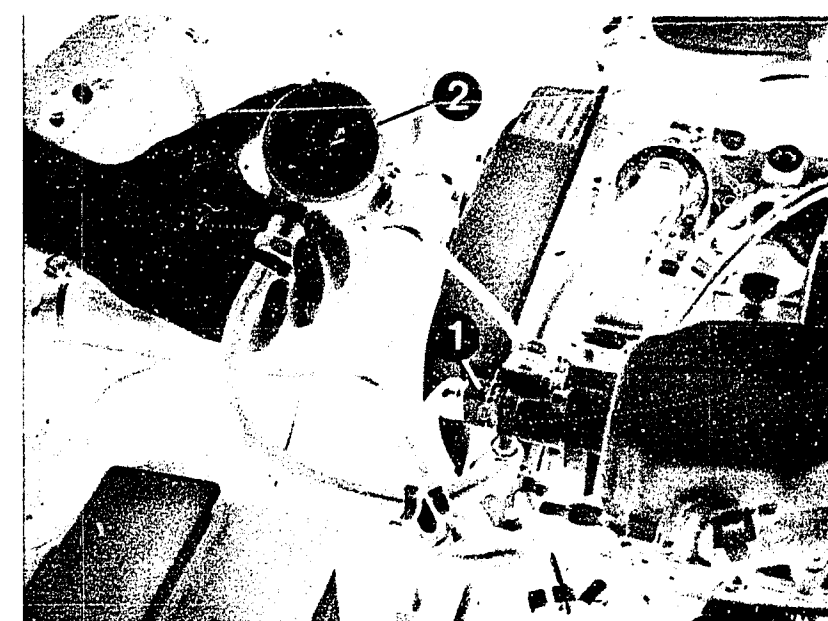
Continued on C10/C11



280/0497

Back of control relay connection base

1 = Start valve
2 = Pressure gauge



C8

Fuel pressure test
Fiat Argenta 120 i.e.



C9

Fuel pressure test
Fiat Argenta 120 i.e.



Fuel pressure test (continued)

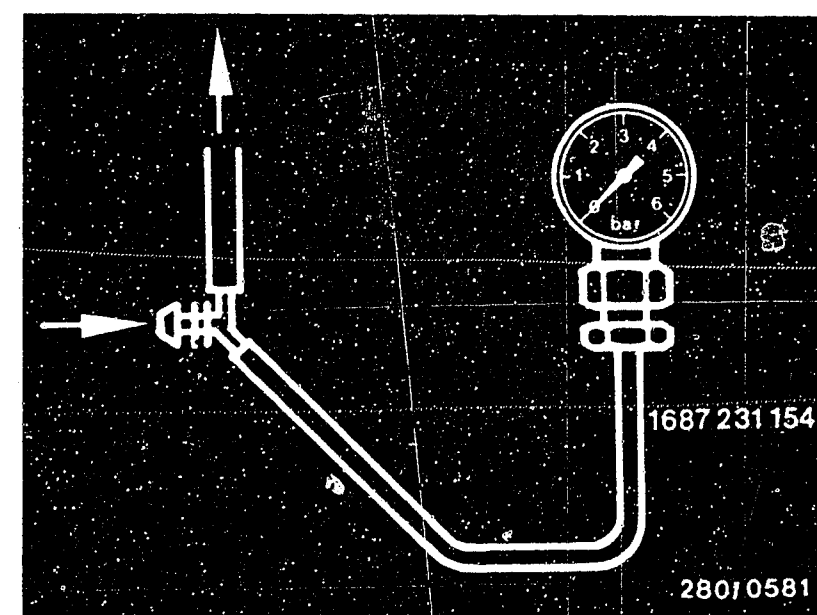
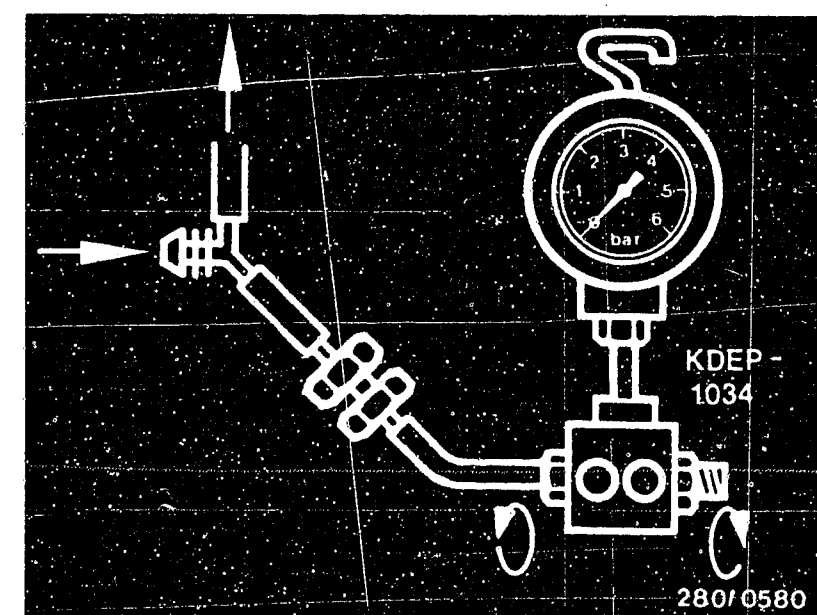
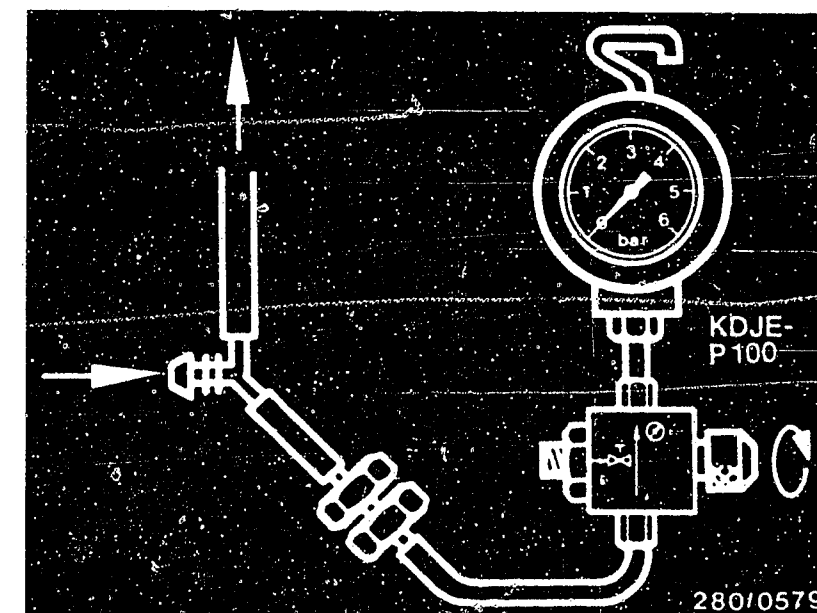
Test fuel pressure

Connect connections of pressure tester into fuel delivery line. If using pressure tester KDJE-P 100, close the hollow screw; on KDEP 1034 close only the right-hand screw. The end of the hose is plugged onto the fuel-distribution pipe, and the free Y-piece connection is plugged onto the fuel delivery hose.

Make sure there are no leaks.

yes

Continued on C12/C13



C10

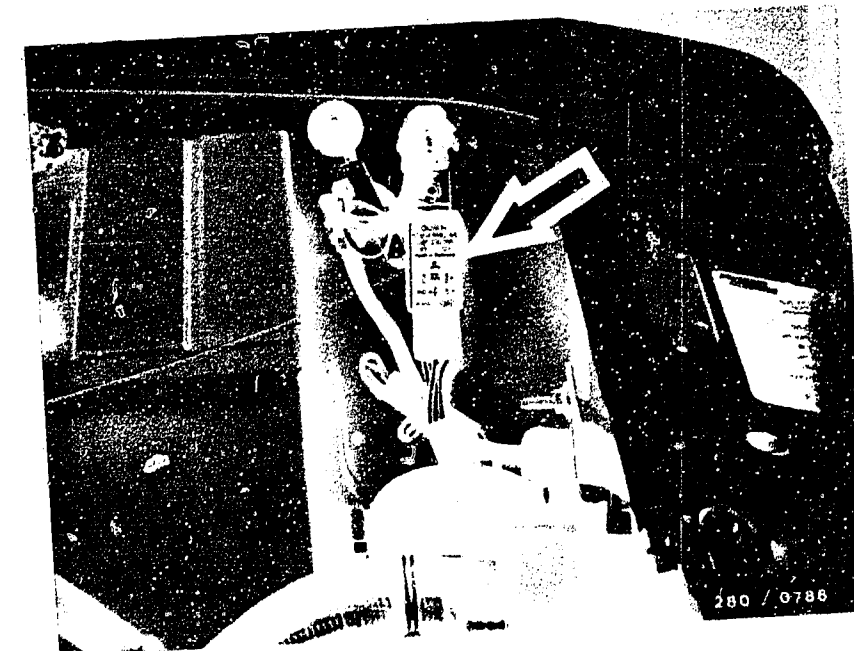
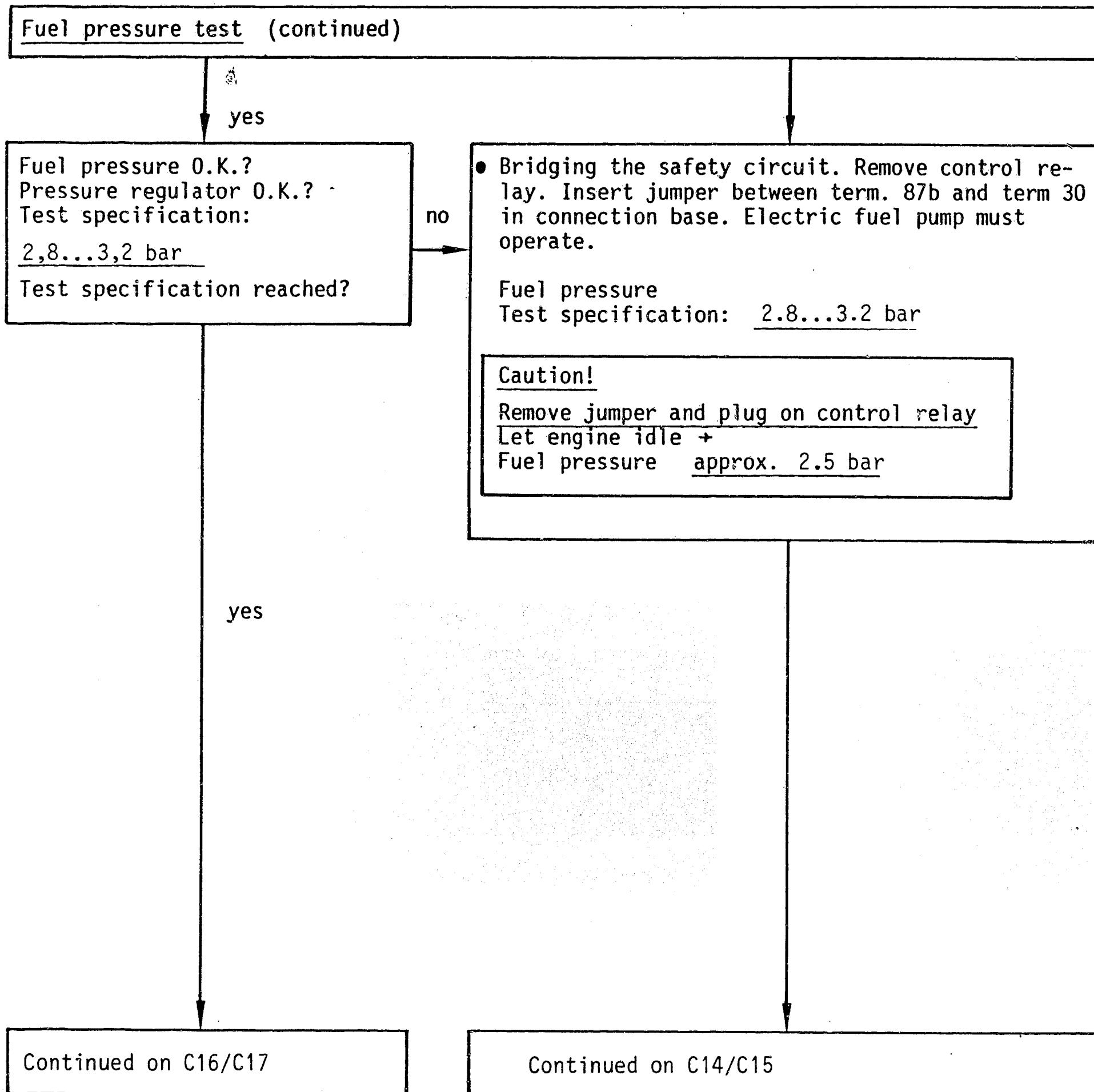
Fuel pressure test
Fiat Argenta 120 i.e.



C11

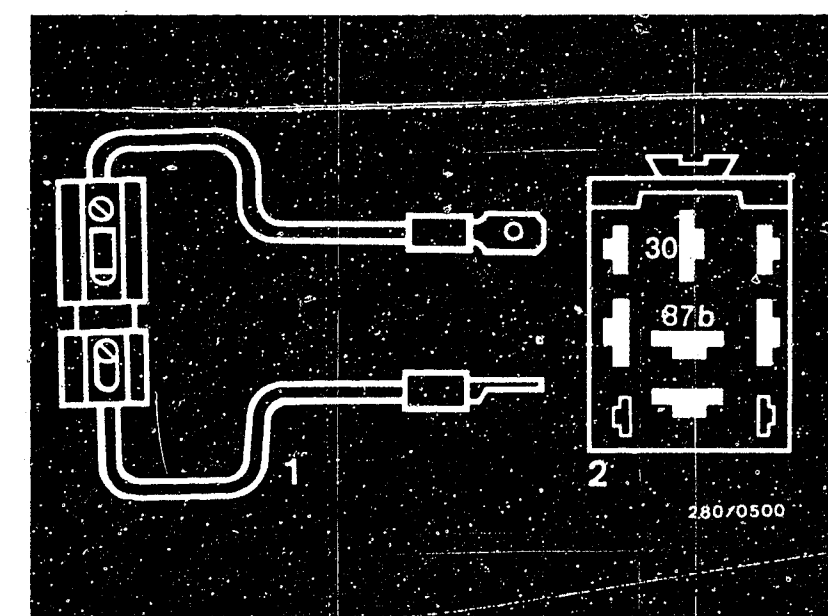
Fuel pressure test
Fiat Argenta 120 i.e.





Arrow = Control relay

Jumper (user-fabricated)
1 = Fuse holder with 10 A fuse
2 = Top view of connection base



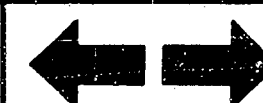
C12

Fuel pressure test
Fiat Argenta 120 i.e.



C13

Fuel pressure test
Fiat Argenta 120 i.e.



Fuel pressure test (continued)

- Test pressure regulator
Fuel pressure
Test specification: 2.8...3.2 bar

Fuel pressure of 2.8 bar not reached:

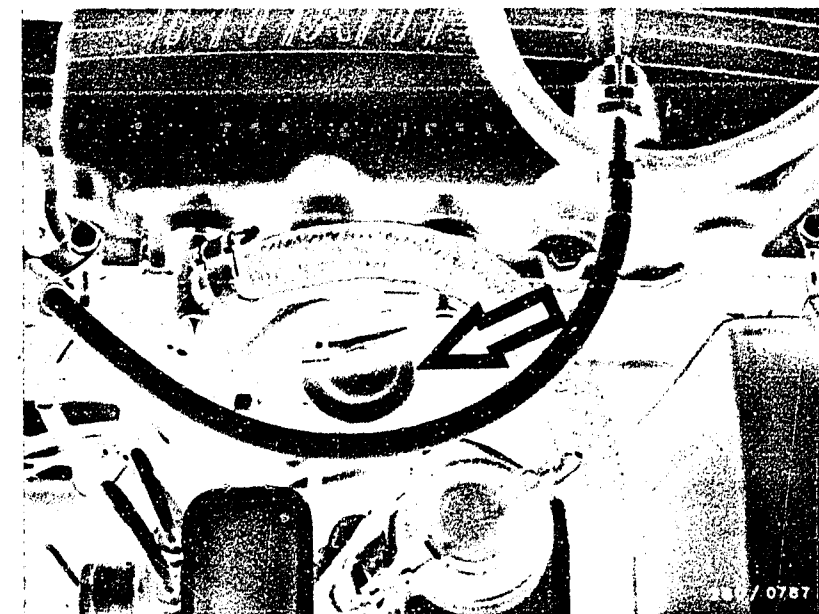
- Slowly pinch off fuel return line.
Caution: do not load pressure gauge above 6 bar.
If pressure rises above 4 bar - replace pressure regulator. The fuel pressure regulator is mounted on the fuel-distribution pipe by a hose piece.
- Fuel delivery line, fuel filter clogged.
- Strainer in tank clogged.
- Corrosion in tank

Fuel pressure of 3.2 bar exceeded:

- Fuel return line clogged or constricted.
- Replace pressure regulator.

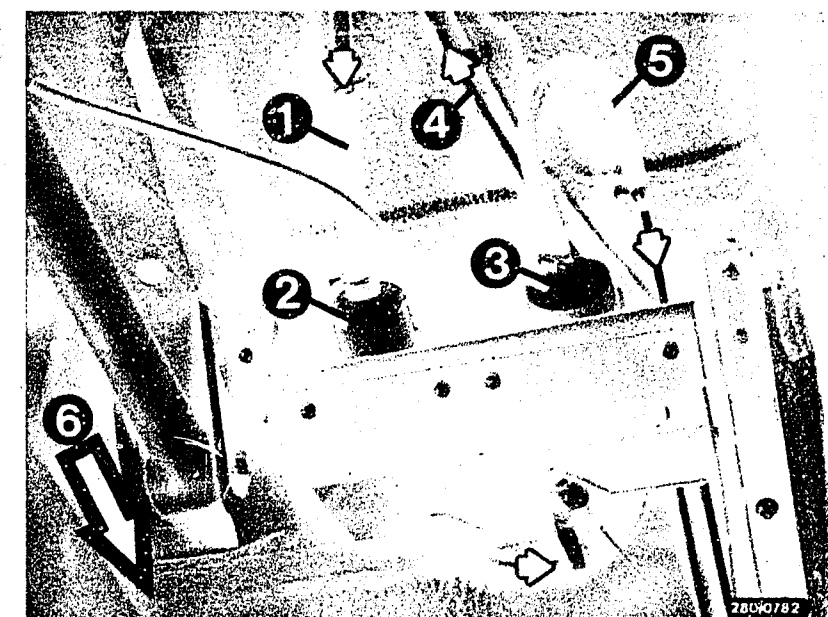
yes

Continued on C16/C17



Arrow=Pressure regulator

- 1=Fuel intake line
- 2=Electric fuel pump (partially hidden in picture)
- 3=Fuel filter
- 4=Fuel return line
- 5=Fuel delivery line



C14

Fuel pressure test
Fiat Argenta 120 i.e.



C15

Fuel pressure test
Fiat Argenta 120 i.e.



Fuel pressure test (continued)

Does fuel pressure remain almost constant after stopping the engine?

Test specification:
2.8...3.2 bar

Test specification reached?

no

The fuel pressure drops quickly after stopping the hot engine.

- Test fuel system for leaks:
Fuel pressure: 2.8...3.2 bar

Remove jumper and observe pressure gauge.
After approx. 20 min. the fuel pressure must still be min. 1.0 bar.

If not:

- Check joints between components and fuel hoses/lines for leaks.
- Pressure regulator (diaphragm)
- Injection valves (needle seat, valve not closing properly)
- Electric fuel pump (leaky non-return valve)
- Fuel filter leaking.

yes

Remove pressure gauge. Re-establish connection between fuel delivery line and fuel-distribution pipe.

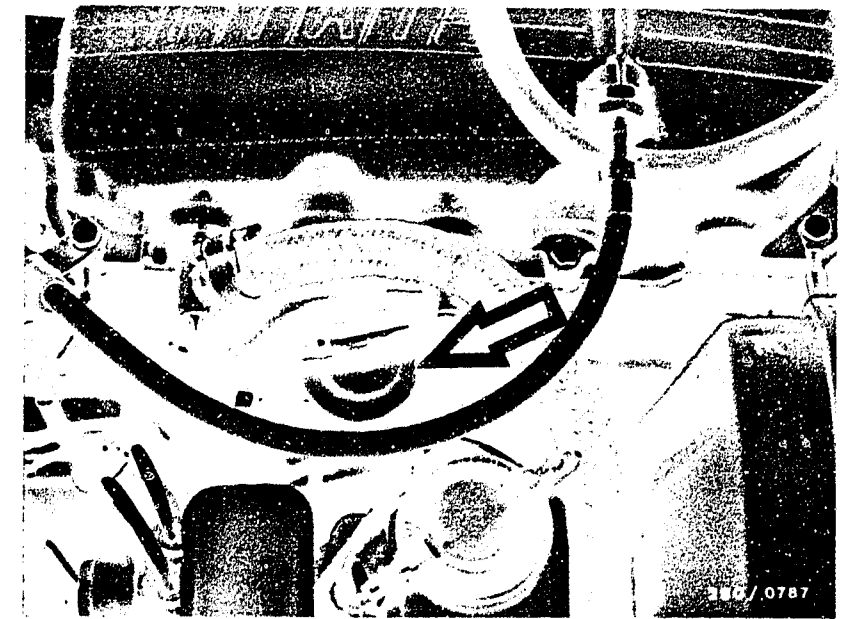
Remove jumper and fit control relay in connection base.

The fuel pressure test is completed.

If the fault has not been found or if further instructions and information are required on how to remedy the fault, continue according to the trouble-shooting chart of your choice.

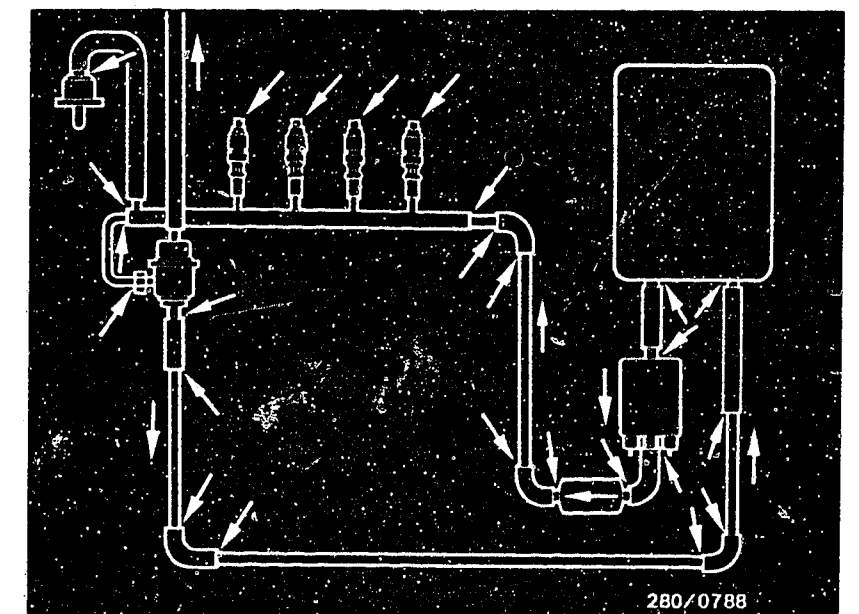
Detailed trouble-shooting chart (Coordinates B3...B4)

Direct trouble-shooting chart (Coordinates B5...B8)



Arrow = Pressure regulator

Diagram of fuel lines
Arrows indicate joints between hoses



C16

Fuel pressure test

Fiat Argenta 120 i.e.



C17

Fuel pressure test

Fiat Argenta 120 i.e.



STARTING MOTOR OPERATES, ENGINE FAILS TO START OR STARTS ONLY WITH GREAT DIFFICULTY

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

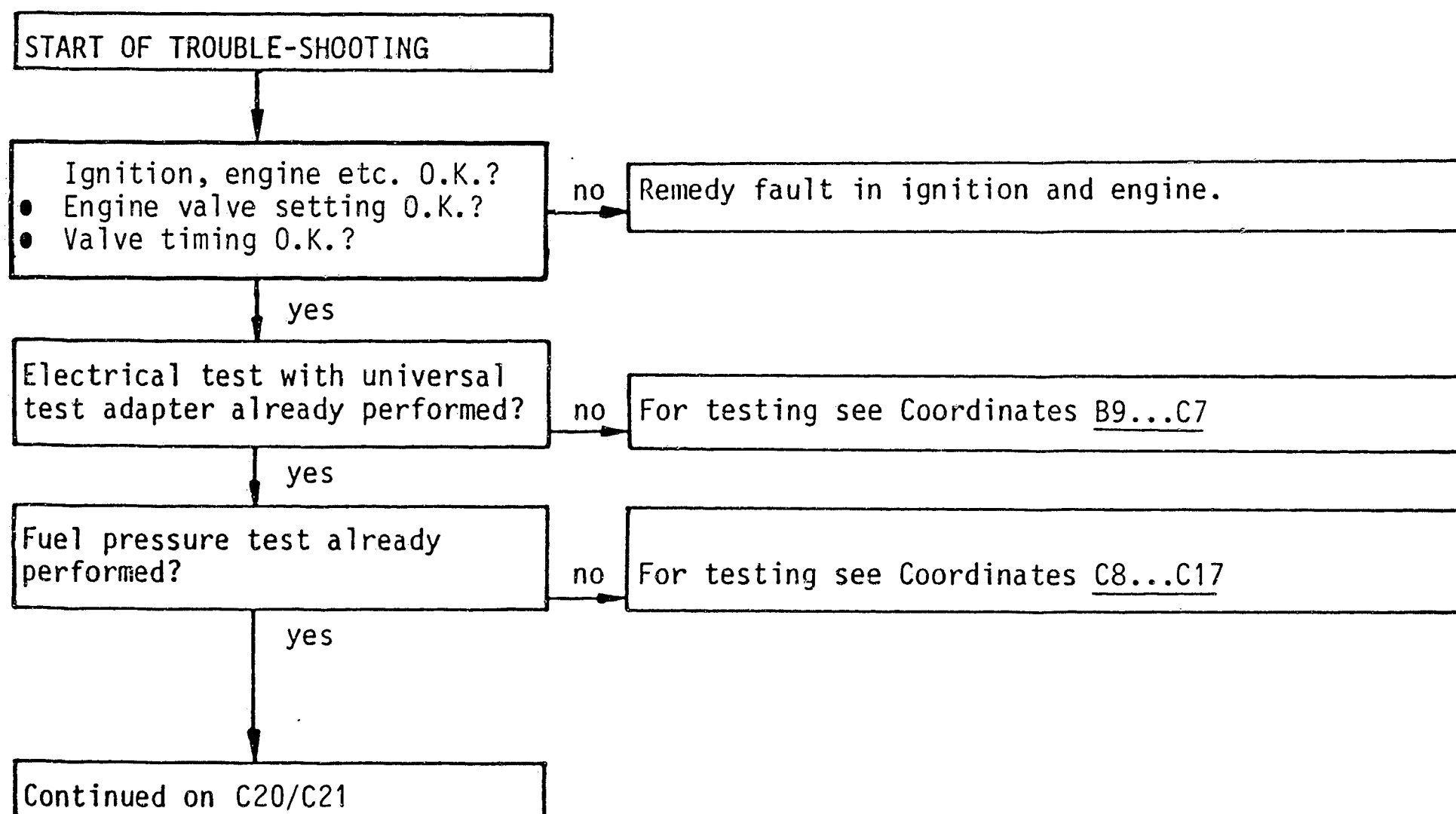
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

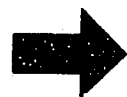
If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



C18

Engine fails to start
Fiat Argenta 120 i.e.



C19

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Start valve O.K.?

no

Functional test:

Check the power supply to the start valve when starting. To do this, remove the plug from the start valve and connect voltmeter to term. 30 and term. 29/term. 4 of the start valve plug.

1. Coolant temperature at ambient temperature ($+15^{\circ}\text{C} \dots 30^{\circ}\text{C}$): Voltage reading min. 6 V.

2. Coolant temperature with engine at normal operating temperature (approx. $+80^{\circ}\text{C}$):

Voltage reading approx. 0 V. Test the following leads for continuity using ohmmeter. (Set value: approx. 0Ω):

Lead from term. 30 on start valve to thermo-time switch term. "W".

Lead from term. 29 on start valve to thermo-time switch term. "G".

Lead from term. 4 control unit to control relay term. 50. Test ground connection of thermo-time switch.

Electrical test of start valve:

Connect ohmmeter to start valve term. 29 and term. 30: Set value approx. 4Ω .

Mechanical test of start valve:

Remove start valve from the intake manifold and hold in a container. (Caution! fire hazard!)

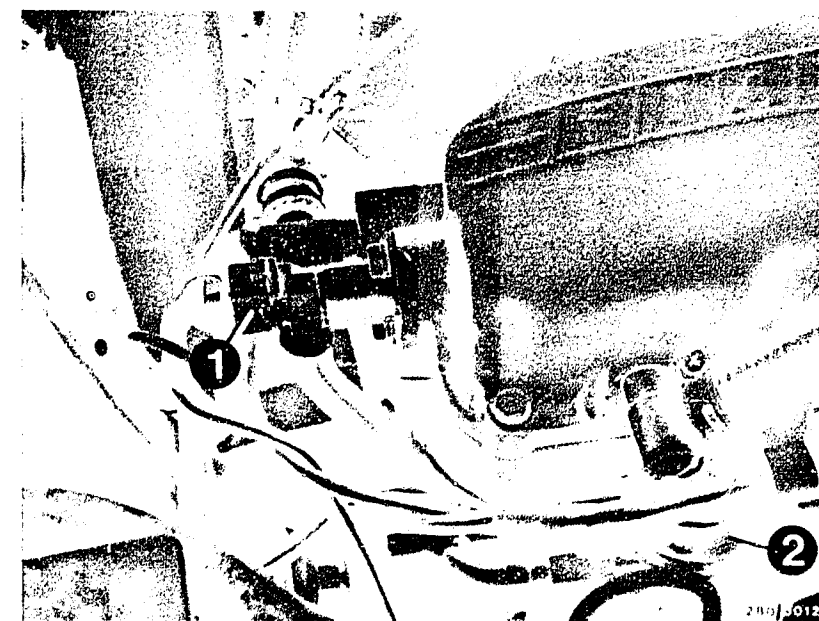
When starting and at ambient temperature ($+15^{\circ}\text{C} \dots 30^{\circ}\text{C}$) the start valve must squirt (max. 8 sec.).

At operating temperature ($+80^{\circ}\text{C}$) the start valve must not squirt. With the ignition switched on and the pressure built up, the start valve must likewise not squirt.

yes

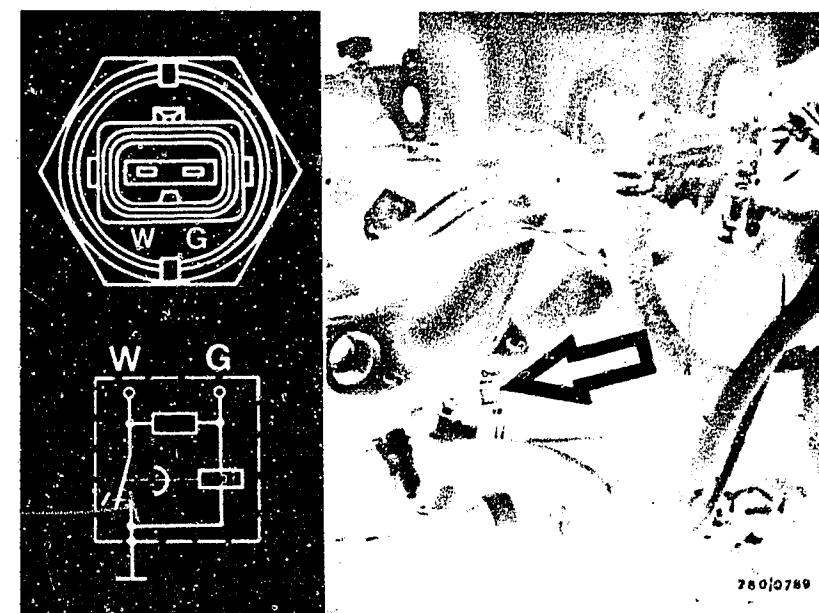
Continued on D1/D2

Continued on C22/C23



1=Start valve (white plug)

Arrow = Thermo-time switch
(brown plug)



C20

Engine fails to start
Fiat Argenta 120 i.e.



C21

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Perform squirt test for engine at normal operating temperature (+80°C) as follows:
Remove plug from thermo-time switch and connect term. "W" to ground. Start engine.

1. When installed:

Pinch off the fuel delivery line at the start valve. If engine then runs smoothly, replace start valve.

2. When removed:

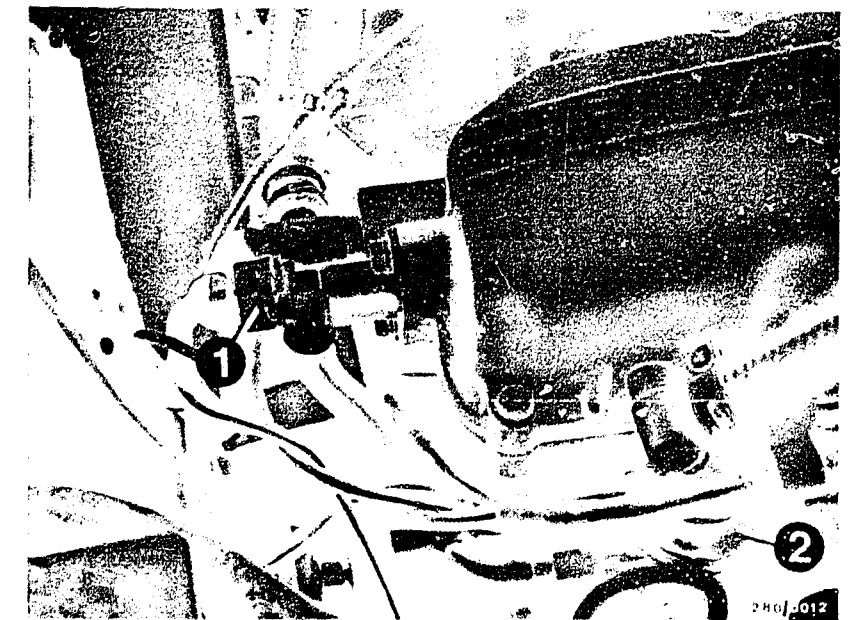
Remove the start valve (caution! fire hazard!). Fuel lines and electric leads remain connected (place collector vessel under the start valve). Build up the fuel pressure (remove control relay and fit jumper into connection base between term. 87b and term. 30).

Caution!

The jumper must be removed again after test is completed and the control relay must be fitted in position.

Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Continued on D1/D2

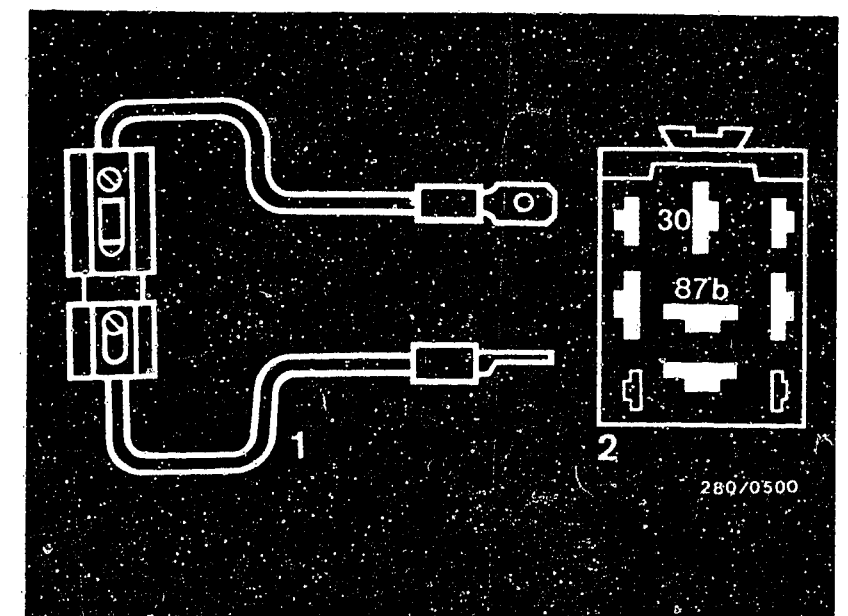


1 = Start valve (white plug)

Jumper (user-fabricated)

1 = Fuse holder with 10 A fuse

2 = Top view of connection base



C22

Engine fails to start
Fiat Argenta 120 i.e.



C23

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Is the thermo-time switch O.K.?

no

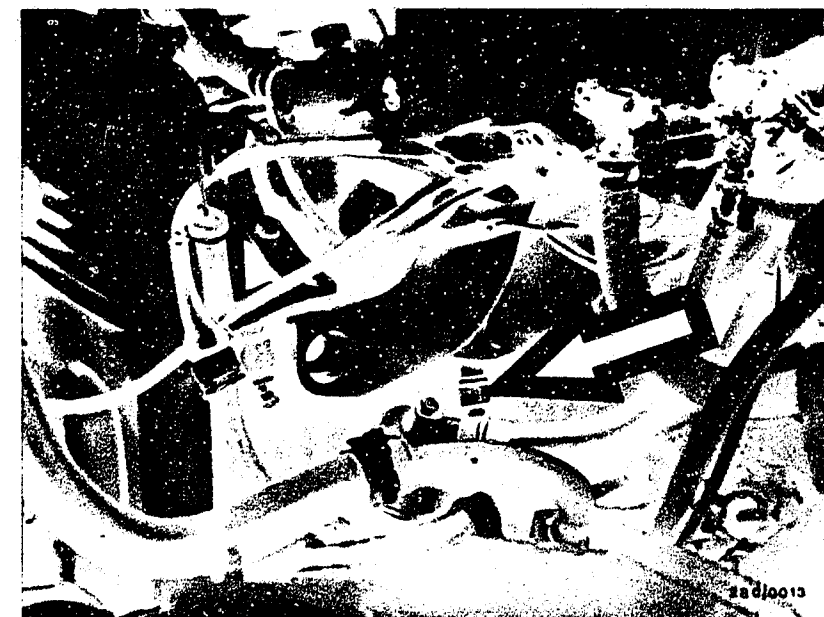
Electrical test:

Check the thermo-time switch 35°/8 sec. as follows. Disconnect the plug and measure with an ohmmeter directly on the thermo-time switch.

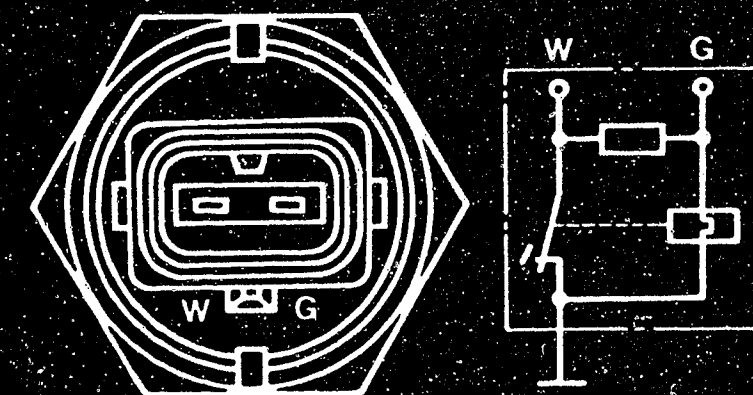
1. Between Term. "G" and ground at ambient temperature (below + 30°C): 25...40 Ω
Eng. at op. temp. (above + 40°C): 50...80 Ω
2. Between Term. "W" and ground at ambient temperature (below + 30°C): 0 Ω
Eng. at op. temp. (above + 40°C): 100...160 Ω
3. Between Term. "G" and "W" at ambient temperature (below + 30°C): 25...40 Ω
Eng. at op. temp. (above + 40°C): 50...80 Ω

yes

Continued on D3/D4



Arrow = Thermo-time switch
(brown plug)



280/0014

D1

Engine fails to start
Fiat Argenta 120 i.e.



D2

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Auxiliary-air device mechanically O.K.?

Free cross section:

- cold - open?
- warm - closed?
- drop in engine speed if hose is pinched off? (cold engine).

no

Testing:

- Visual examination of auxiliary-air device
Disconnect hoses and look down (possibly using a small mirror). When cold, the cross-section must be partially open; when the engine is warm it must be closed. If not, replace auxiliary-air device.
- Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop noticeably. If not, replace auxiliary-air device (pay attention to direction of flow).

yes

Electrical operation of auxiliary-air device (power supply, ground lead, resistance) O.K.?

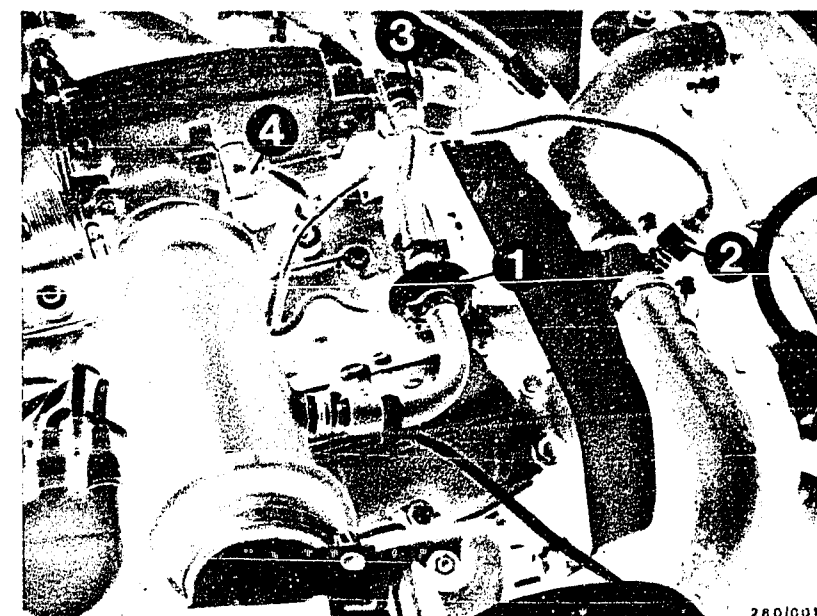
no

Start engine.

- Voltage at plug min. 12 V. If not, test the following leads for continuity (set value approx. 0 Ω):
 - From term. 26 to output stage ground terminal.
 - From term. 9/2 to control-unit plug term. 9.
- Resistance of auxiliary-air device 35...70 Ω (plug disconnected).
If resistance outside tolerance, replace auxiliary-air device.

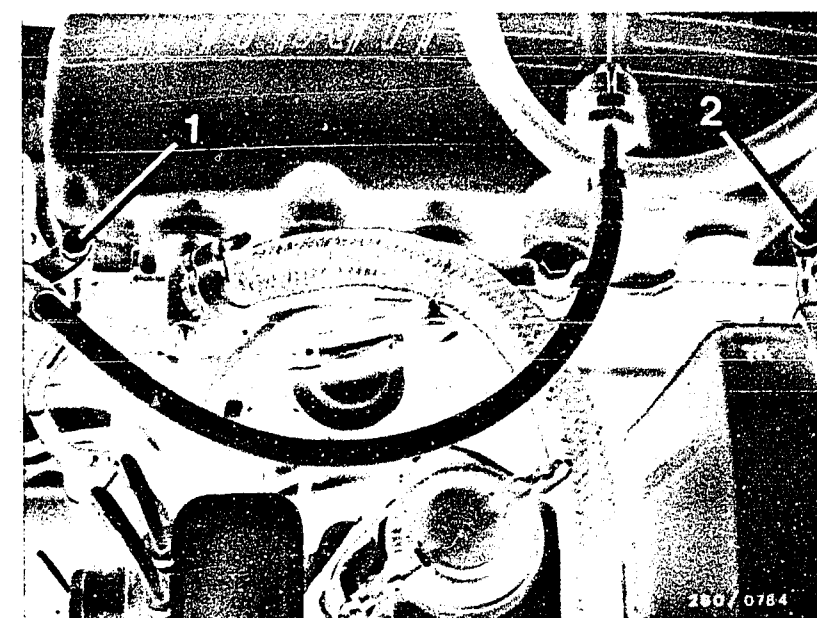
yes

Continued on D5/D6



1=Auxiliary-air device
2=Temperature sensor II (engine)

1=Electronics ground terminal
2=Output stage ground terminal



D3

Engine fails to start
Fiat Argenta 120 i.e.



D4

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Air-flow sensor O.K.?

yes

yes

Continued on D7/D8

no

Testing:

Unscrew hose between air filter and air-flow sensor.

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close fully again by itself. The air-flow sensor flap must not catch when it is being opened. Watch for signs of abrasion and rubbing. Clean the air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are traces of abrasion or rubbing, replace the air-flow sensor.

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

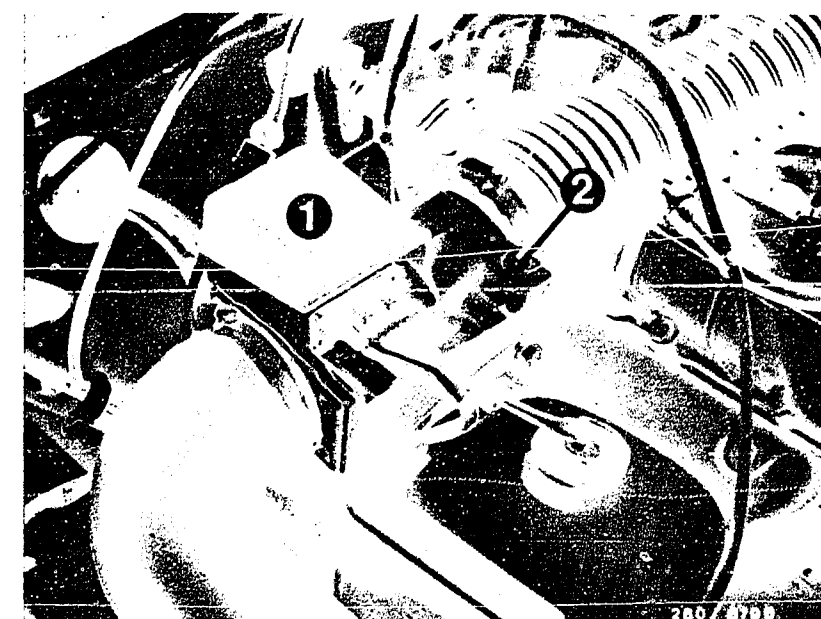
Test specification: $160...300\ \Omega$

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.

Test specification: $60...1000\ \Omega$

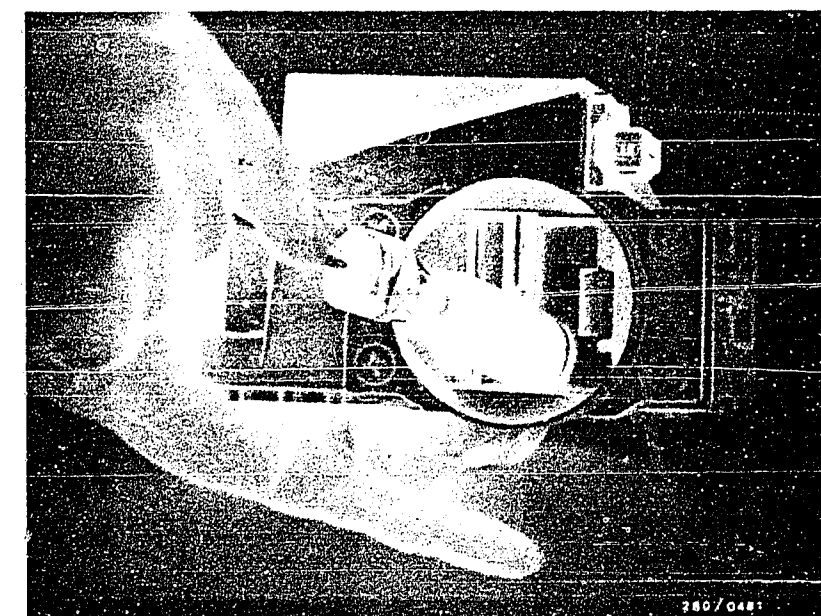
Air-flow sensor flap must return to rest position. If not, the stopper or the air-flow sensor flap is bent. Replace the air-flow sensor.

Caution! After testing is completed, refit the hose between air filter and air-flow sensor.



1 = Air-flow sensor
2 = CO adjusting screw

Opening air-flow sensor flap.



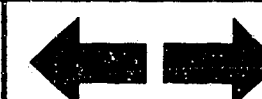
D5

Engine fails to start
Fiat Argenta 120 i.e.



D6

Engine fails to start
Fiat Argenta 120 i.e.



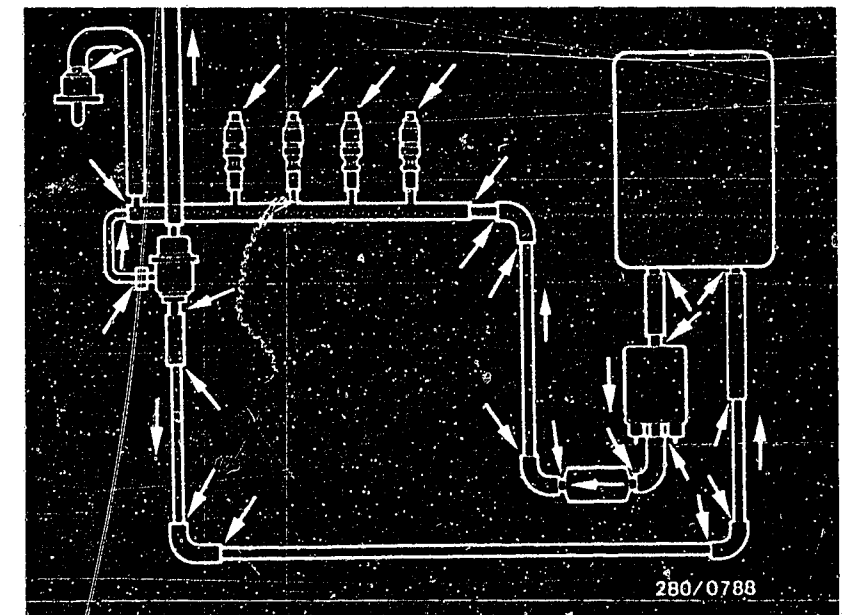
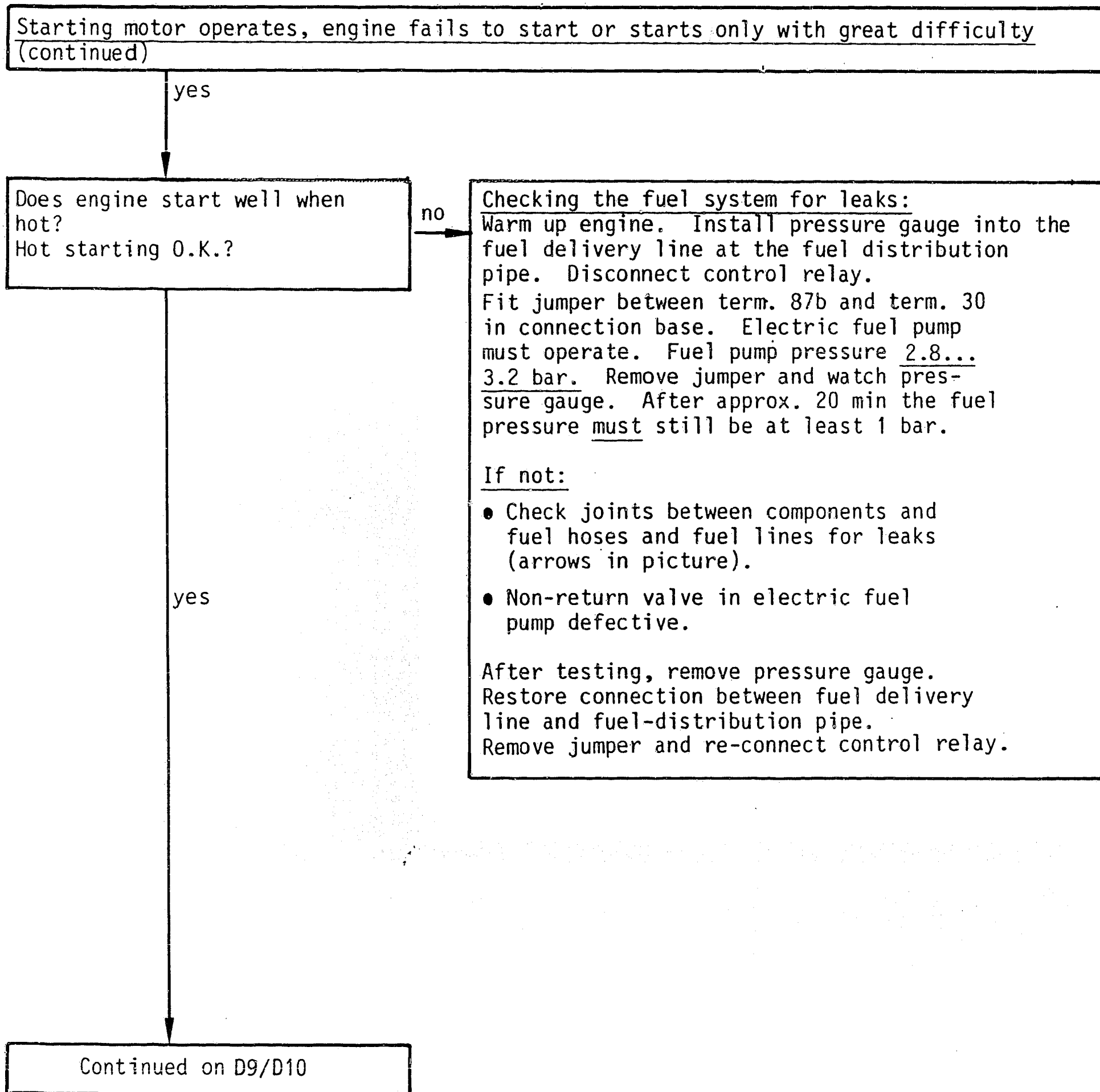
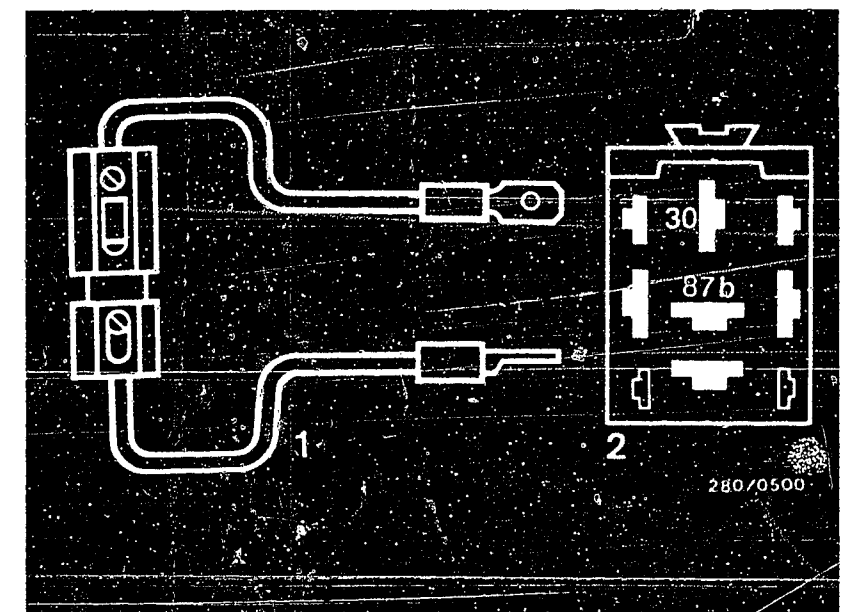


Diagram of fuel lines
Arrows indicate joints between hoses and components.

Jumper (user-fabricated)
1=Fuse holder with 10 A fuse
2=Top view of connection base



D7

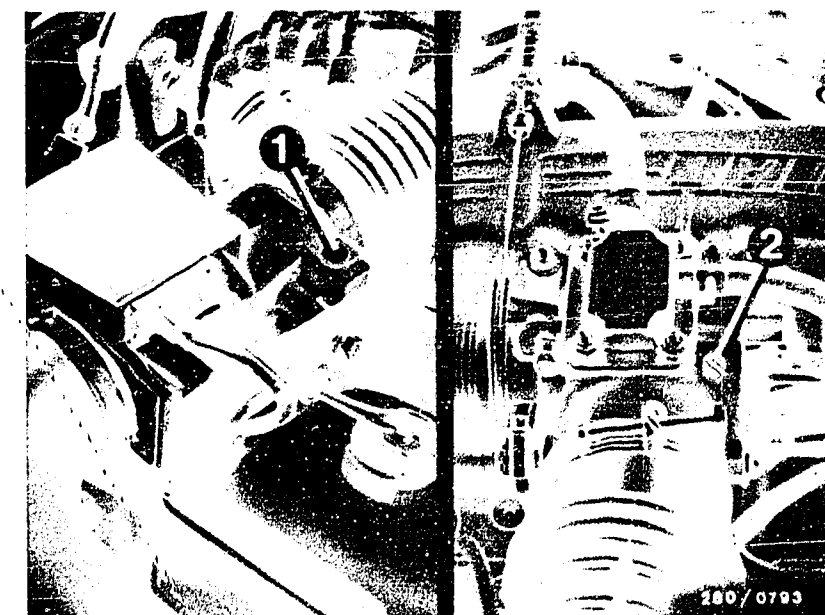
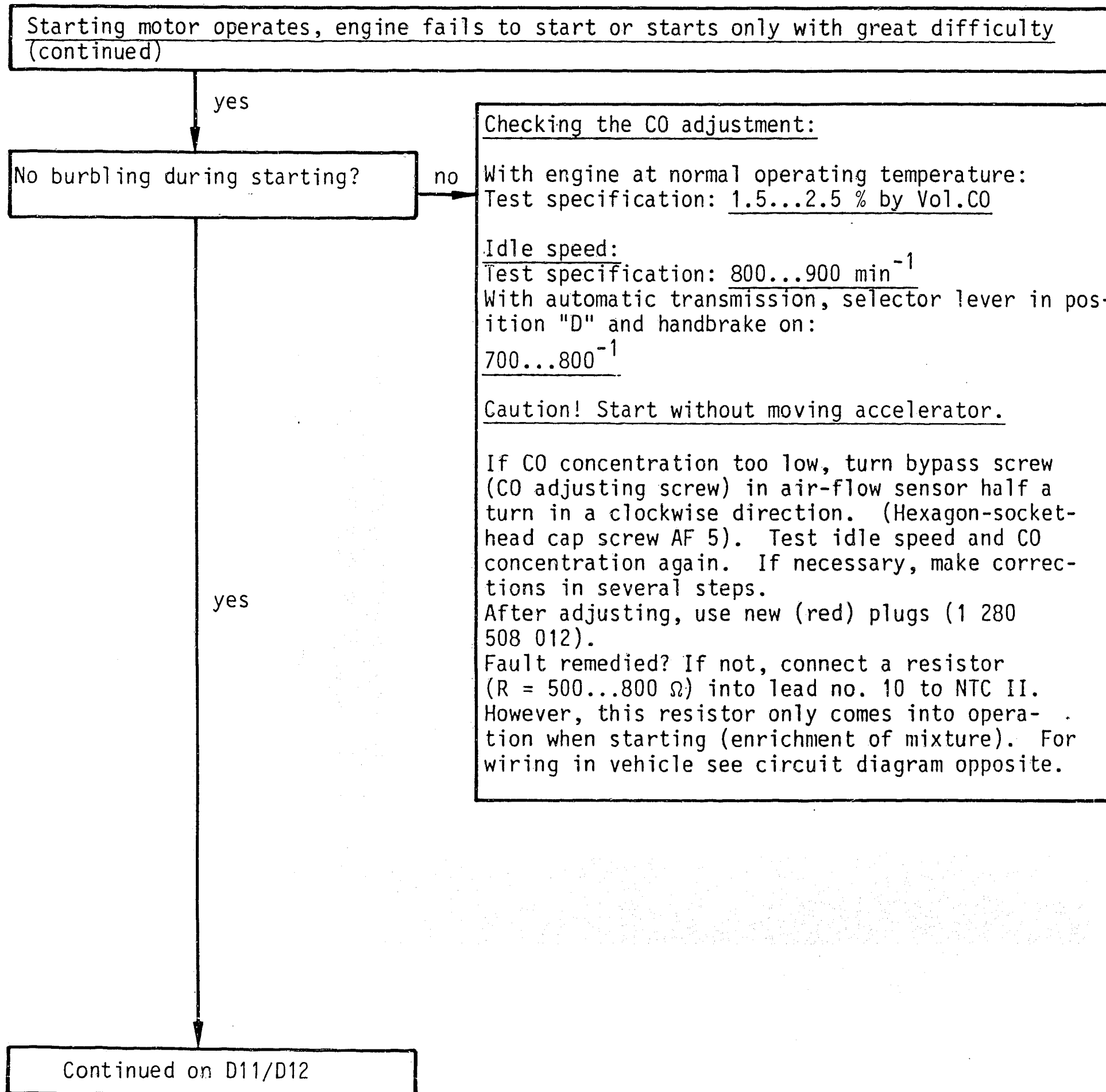
Engine fails to start
Fiat Argenta 120 i.e.



D8

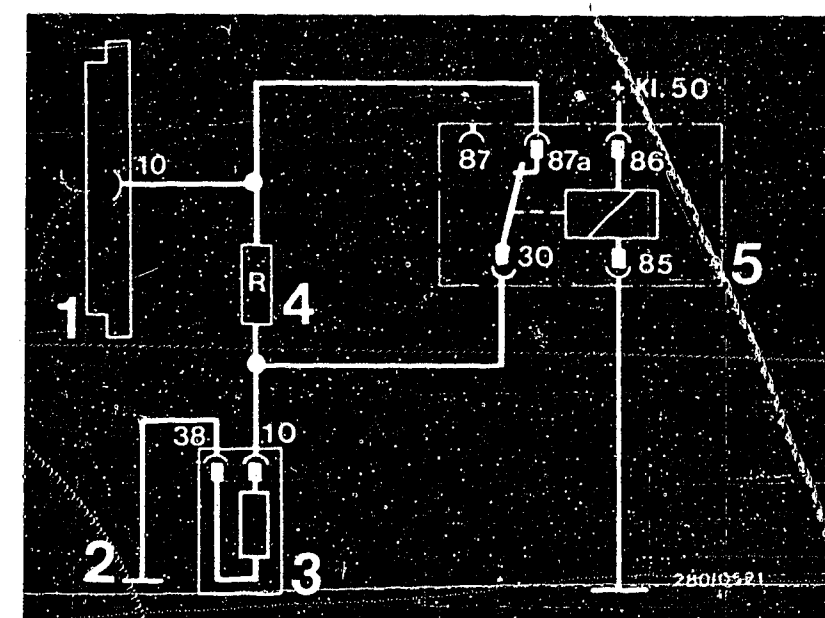
Engine fails to start
Fiat Argenta 120 i.e.





- 1 = CO adjusting screw
2 = Idle-speed adjusting screw

- 1 = Multiple plug
2 = Electronics ground terminal
3 = Temperature sensor II
4 = Resistor 500...800 Ω
0.3 W
5 = Relay (e.g. 0 332 204 150)
Leads 0.75 mm²



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Are all hose lines correctly attached, not kinked or damaged?
Visual examination.
Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

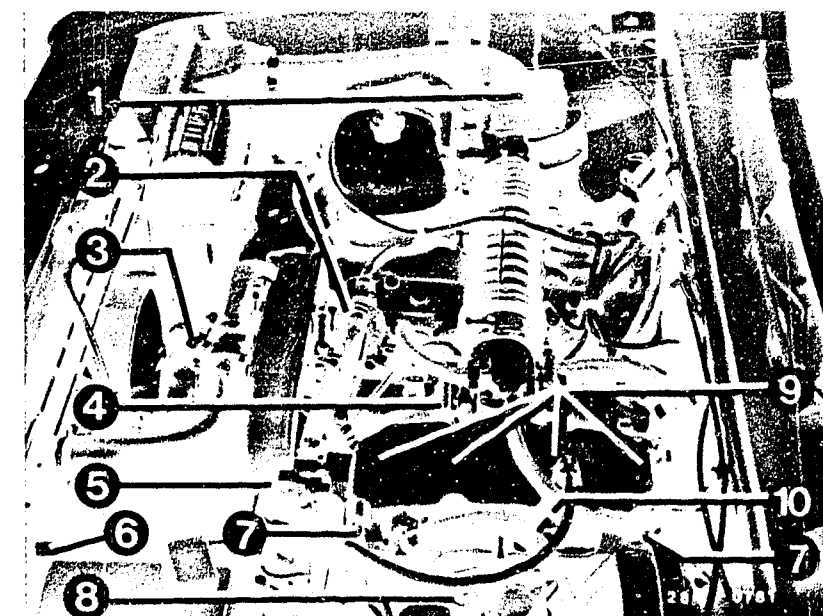
Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Leak test:

Seal off exhaust tail pipe. Unscrew hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and, using compressed-air gun, blow air (0.3 bar gauge pressure) into the intake manifold. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Leaks may also occur at the following points on the engine: Oil dipstick incorrectly inserted, defective oil filler neck lid seal etc. Bubbling or foaming indicates a leak.

yes

Continued on D13/D14



- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

D11

Engine fails to start
Fiat Argenta 120 i.e.



D12

Engine fails to start
Fiat Argenta 120 i.e.



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Testing completed for customer complaint

"Starting motor operates, engine fails to start or starts only with great difficulty"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).

D13

Engine fails to start
Fiat Argenta 120 i.e.



D14

Engine fails to start
Fiat Argenta 120 i.e.



ENGINE STARTS BUT THEN DIES

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

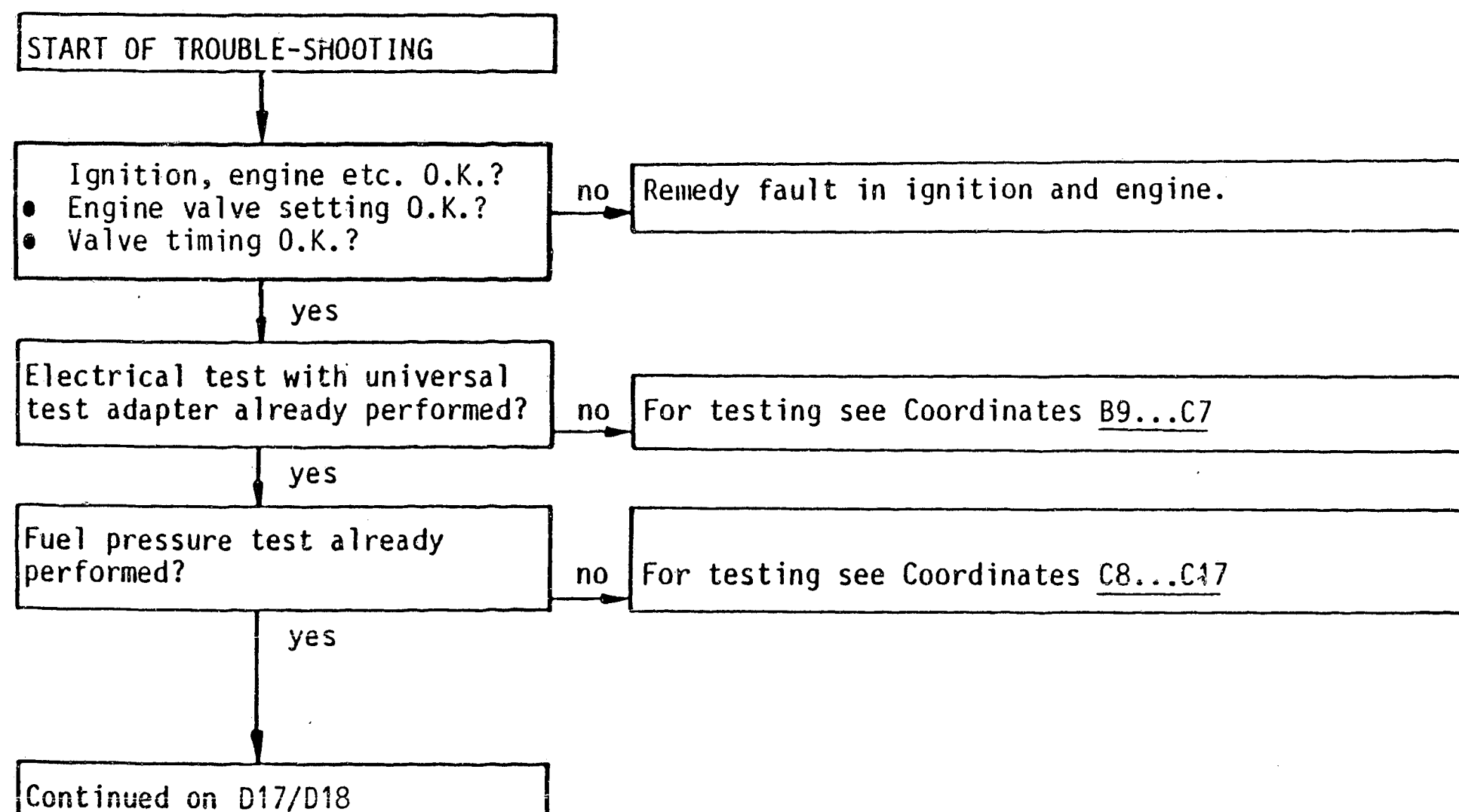
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



D15

Engine starts but then dies
Fiat Argenta 120 i.e.



D16

Engine starts but then dies
Fiat Argenta 120 i.e.



Engine starts but then dies (continued)

yes

Start valve O.K.?
(leak test)

no

Testing the start valve for leaks

1. When installed:

Pinch off the fuel delivery line at the start valve. If engine then runs smoothly, replace start valve.

2. When removed:

Remove the start valve (caution! fire hazard!). Fuel lines and electric leads remain connected (place collector vessel under the start valve). Build up the fuel pressure (remove control relay and fit jumper into connection base between term. 87b and term. 30).

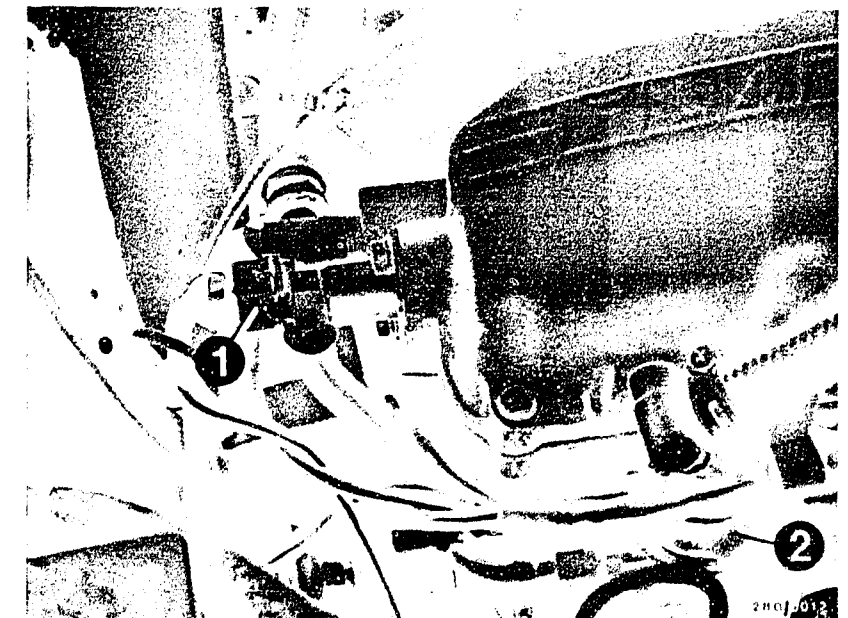
Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution!

The jumper must be removed again after test is completed and the control relay must be fitted in position.

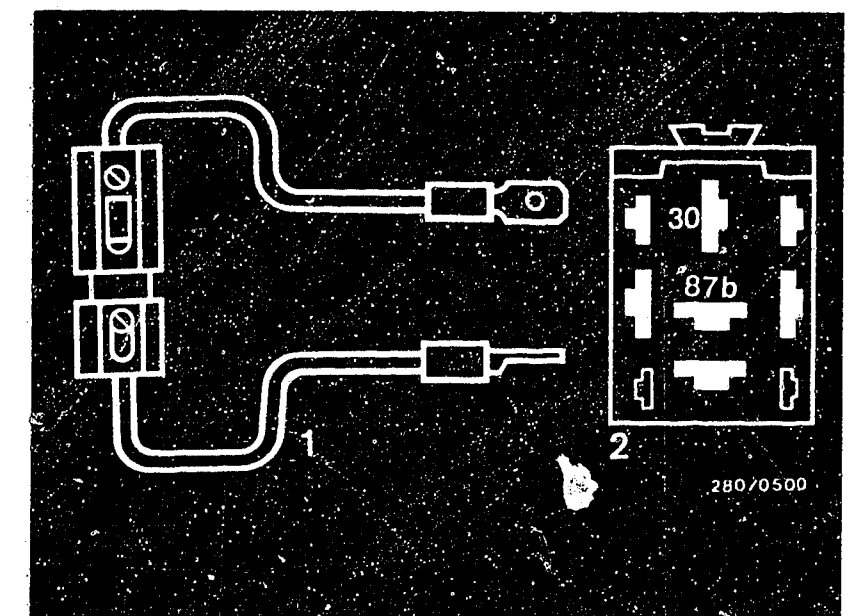
yes

Continued on D19/D20



1 = Start valve
(white plug)

Jumper (user-fabricated)
1 = Fuse holder with 10 A fuse
2 = Top view of connection base



D17

Engine starts but then dies
Fiat Argenta 120 i.e.



D18

Engine starts but then dies
Fiat Argenta 120 i.e.



Engine starts but then dies (continued)

yes

Auxiliary-air device mechanically O.K.?

Free cross section:

- cold - open?
- warm - closed?
- drop in engine speed if hose is pinched off? (cold engine).

no

Testing:

- Visual examination of auxiliary-air device
Disconnect hoses and look down (possibly using a small mirror). When cold, the cross-section must be partially open; when the engine is warm it must be closed. If not, replace auxiliary-air device.
- Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop noticeably. If not, replace auxiliary-air device (pay attention to direction of flow).

yes

Electrical operation of auxiliary-air device (power supply, ground lead, resistance) O.K.?

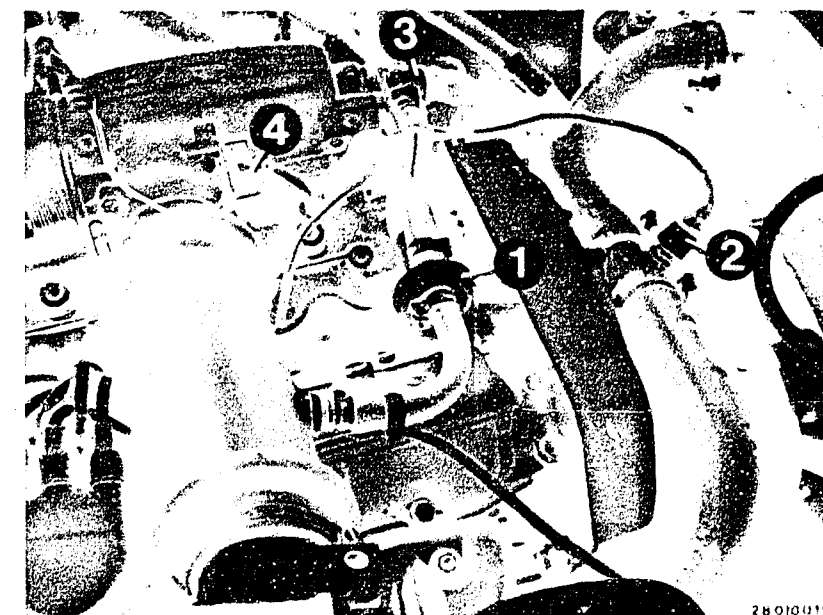
no

Start engine.

- Voltage at plug min. 12 V. If not, test the following leads for continuity (set value approx. 0 Ω):
 - From term. 26 to output stage ground terminal.
 - From term. 9/2 to control-unit plug term. 9.
- Resistance of auxiliary-air device 35...70 Ω (plug disconnected).
If resistance outside tolerance, replace auxiliary-air device.

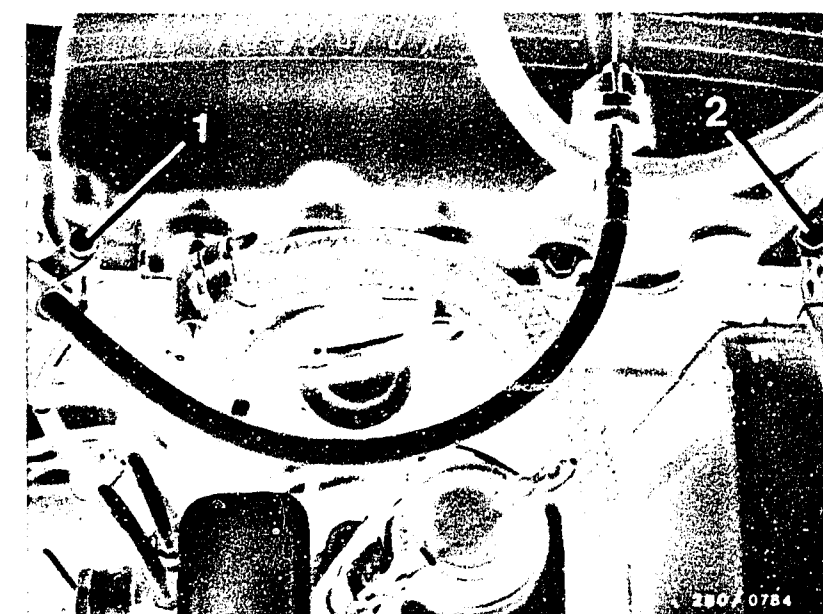
yes

Continued on D21/D22



1=Auxiliary-air device
2=Temperature sensor II (engine)

2=Output stage ground terminal



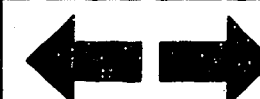
D19

Engine starts but then dies
Fiat Argenta 120 i.e.



D20

Engine starts but then dies
Fiat Argenta 120 i.e.



Engine starts but then dies (continued)

yes

Are all hose lines correctly attached, not kinked or damaged?
Visual examination.
Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

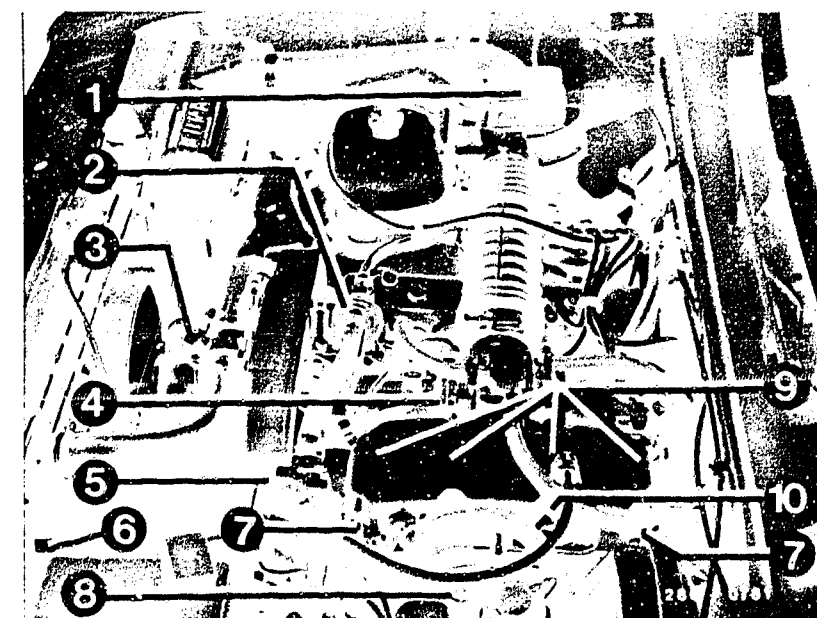
Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Leak test:

Seal off exhaust tail pipe. Unscrew hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and, using compressed-air gun, blow air (0.3 bar gauge pressure) into the intake manifold. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Leaks may also occur at the following points on the engine: Oil dipstick incorrectly inserted, defective oil filler neck lid seal etc. Bubbling or foaming indicates a leak.

yes

Continued on D23/D24



- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

D21

Engine starts but then dies
Fiat Argenta 120 i.e.



D22

Engine starts but then dies
Fiat Argenta 120 i.e.



Engine starts but then dies (continued)

yes

Testing completed for customer complaint

"Engine starts but then dies"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (See Coordinates B3...B8).
If the fault has not been detected by "Direct trouble-shooting", see "Detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K.
(Compression, valve setting, valve timing, worn camshaft).

D23

Engine starts but then dies
Fiat Argenta 120 i.e.



D24

Engine starts but then dies
Fiat Argenta 120 i.e.



UNEVEN ENGINE IDLE, INCORRECT IDLE SPEED

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

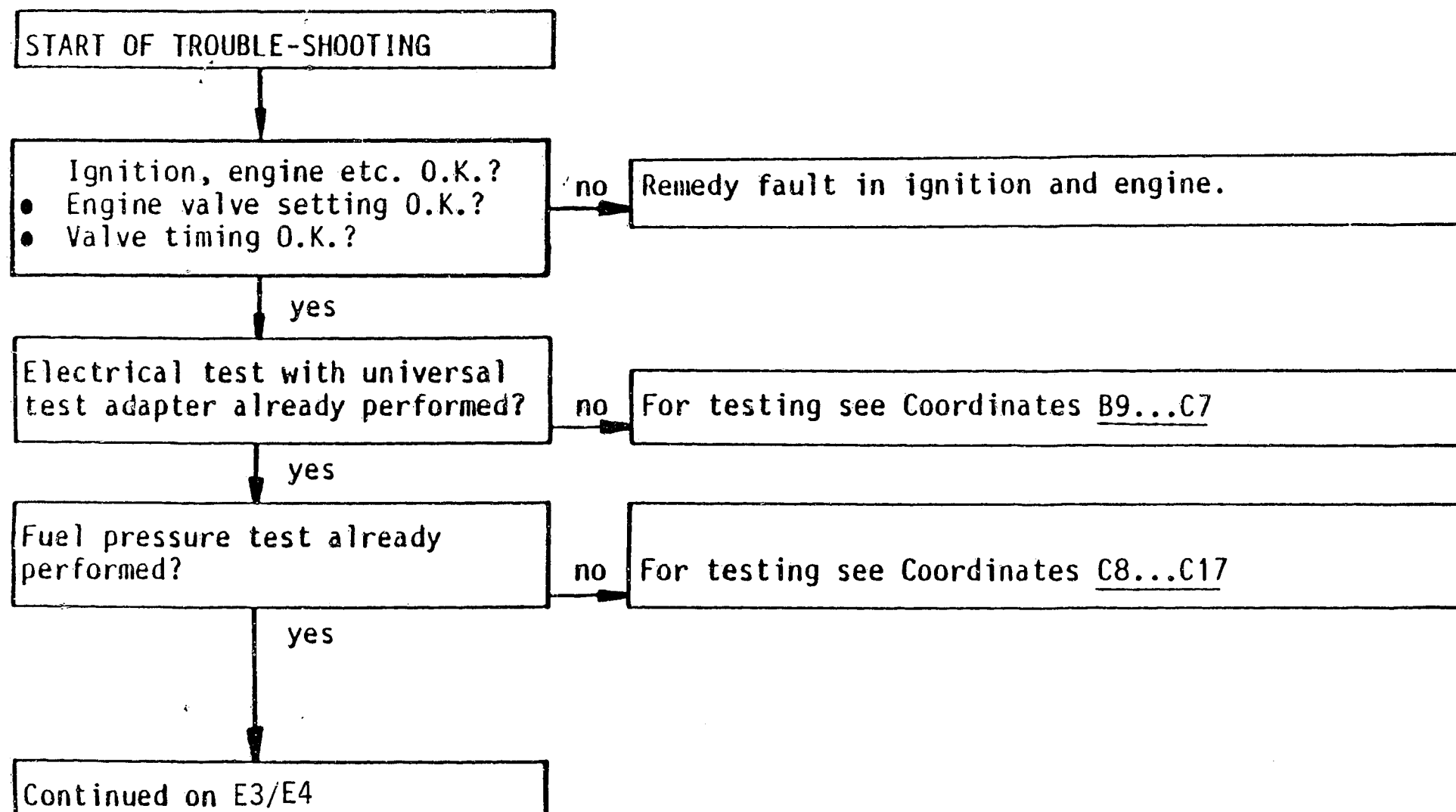
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



E1

Uneven engine idle
Fiat Argenta 120 i.e.



E2

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Throttle valve closed?

- Throttle lever coming up against stop screw?
- Throttle cable free of tension?
- Throttle cable without kinks?

no

• Testing:

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

• Adjusting the throttle valve:

Throttle valve must come up against the stop screw with the throttle lever just before it sticks. Lock stop screw with lock nut.

- If throttle cable kinked - replace.

yes

Throttle-valve switch correctly adjusted?

- Idle contact closing?
- Microswitch can be heard to click?

no

• Adjusting the throttle-valve switch

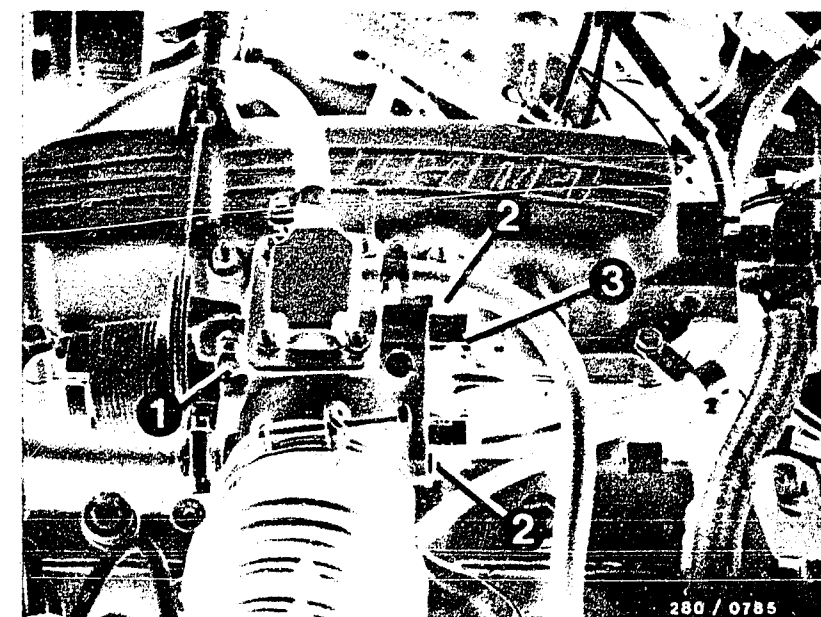
Slightly loosen the throttle-valve switch fastening screws. Connect ohmmeter to throttle-valve switch between term. 2 and term. 18. Turn throttle-valve switch in a clockwise direction until idle contact closes (microswitch can be heard to click)
Reading 0 Ω .

• Checking the adjustment:

Pull slightly on throttle cable. The idle contact opens (microswitch can be heard to click).
Reading $\infty \Omega$.

yes

Continued on E5/E6



1 = Throttle-valve stop screw

2 = Fastening screws

3 = Throttle-valve switch

E3

Uneven engine idle
Fiat Argenta 120 i.e.



E4

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes
CO and idle speed correctly
adjusted?

no

CO and idle adjustment

Exhaust-gas adjustment with exhaust-gas analyzer
with engine at normal operating temperature and at
idle speed.

Idle speed:

Manually-shifted transmission: 800...900 min⁻¹

Automatic transmission (selector lever in position
"D" and handbrake on): 700...800 min⁻¹

CO adjustment: 1.5...2.5 % by Vol.CO

If CO concentration too high, turn by-pass screw
(CO adjusting screw) in air-flow sensor half a turn
in a counterclockwise direction (hexagon-socket-
head cap screw AF5). Check idle speed and CO con-
centration again. if necessary, make corrections
in several steps.

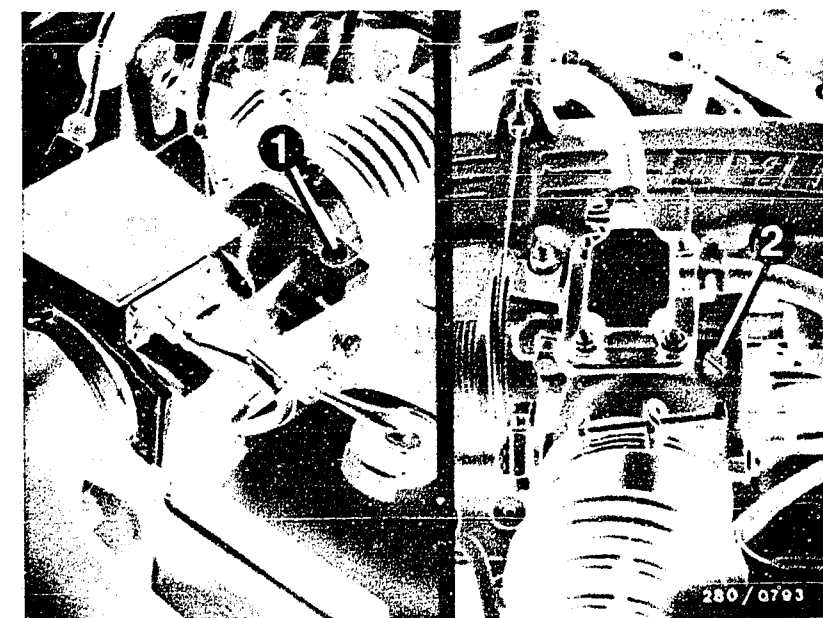
After adjusting, use new (red) plugs (1 280 508 012).

yes

Idle speed not adjustable.

yes

Continued on E7/E8



1=CO adjusting screw
2=Idle adjusting screw

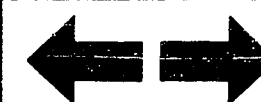
E5

Uneven engine idle
Fiat Argenta 120 i.e.



E6

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Auxiliary-air device mechanically O.K.?
Free cross section:
• cold - open?
• warm - closed?
• drop in engine speed if hose is pinched off? (cold engine).

no

Testing:

- Visual examination of auxiliary-air device
Disconnect hoses and look down (possibly using a small mirror). When cold, the cross-section must be partially open; when the engine is warm it must be closed. If not, replace auxiliary-air device.
- Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop noticeably. If not, replace auxiliary-air device (pay attention to direction of flow).

yes

Electrical operation of auxiliary-air device (power supply, ground lead, resistance) O.K.?

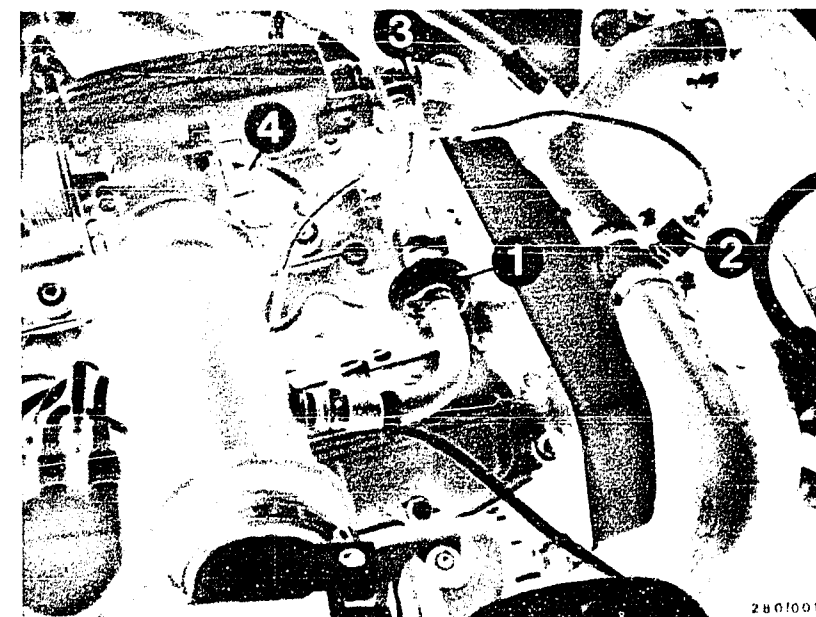
no

Start engine.

- Voltage at plug min. 12 V. If not, test the following leads for continuity (set value approx. 0 Ω):
 - From term. 26 to output stage ground terminal.
 - From term. 9/2 to control-unit plug term. 9.
- Resistance of auxiliary-air device 35...70 Ω (plug disconnected).
If resistance outside tolerance, replace auxiliary-air device.

yes

Continued on E9/E10



1=Auxiliary-air device
2=Temperature sensor II (engine)

2=Output stage ground terminal



E7

Uneven engine idle
Fiat Argenta 120 i.e.



E8

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Start valve O.K.?
(leak test)

no

Testing the start valve for leaks

1. When installed:

Pinch off the fuel delivery line at the start valve. If engine then runs smoothly, replace start valve.

2. When removed:

Remove the start valve (caution! fire hazard!). Fuel lines and electric leads remain connected (place collector vessel under the start valve). Build up the fuel pressure (remove control relay and fit jumper into connection base between term. 87b and term. 30).

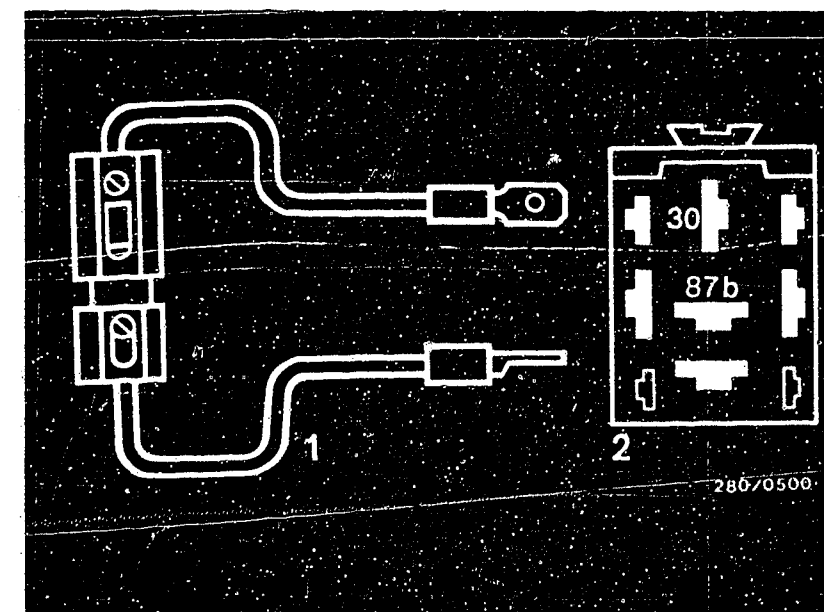
Test specification: Within one minute max. 1 drop may form at the mouth of the valve.

Caution!

The jumper must be removed again after test is completed and the control relay must be fitted in position.

yes

Continued on E11/E12

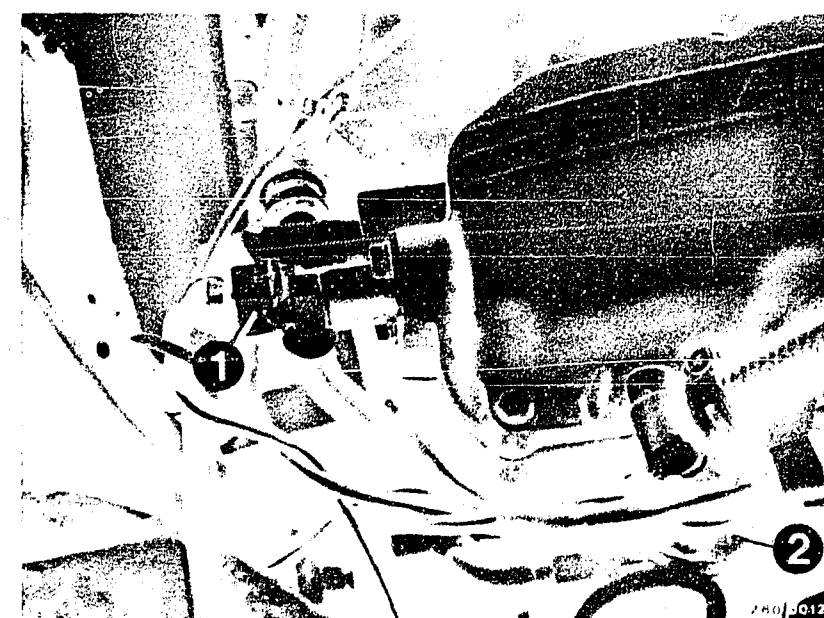


Jumper (user-fabricated)

1 = Fuse holder with 10 A fuse

2 = Top view of connection base

1 = Start valve
(white plug)



E9

Uneven engine idle
Fiat Argenta 120 i.e.



E10

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

Is the thermo-time switch O.K.?

no

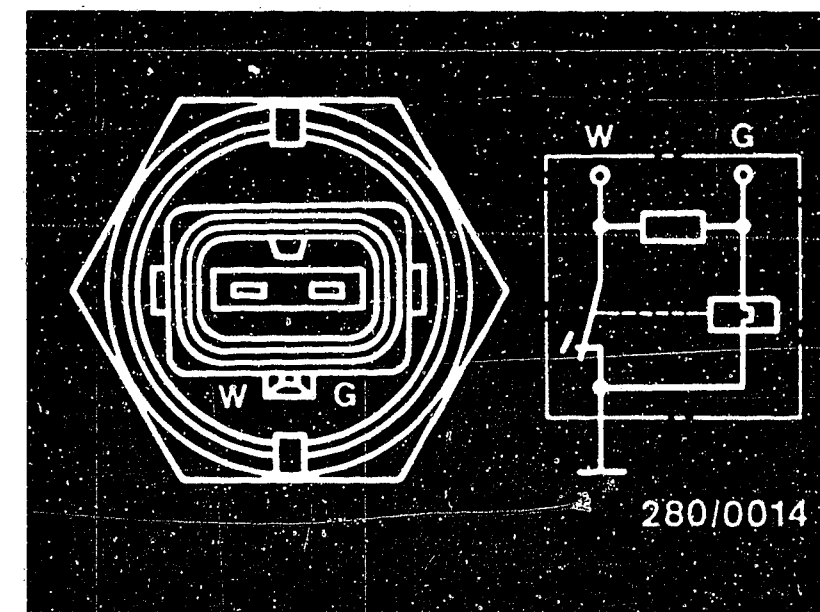
Electrical test:

Check the thermo-time switch 35°/8 sec. as follows. Disconnect the plug and measure with an ohmmeter directly on the thermo-time switch.

1. Between Term. "G" and ground at ambient temperature (below + 30°C): 25...40 Ω
Eng. at op. temp. (above + 40°C): 50...80 Ω
2. Between Term. "W" and ground at ambient temperature (below + 30°C): 0 Ω
Eng. at op. temp. (above + 40°C): 100...160 Ω
3. Between Term. "G" and "W" at ambient temperature (below + 30°C): 25...40 Ω
Eng. at op. temp. (above + 40°C): 50...80 Ω

yes

Continued on E13/E14



Arrow = Thermo-time switch
(brown plug)

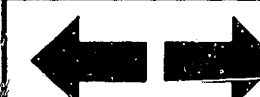
E11

Uneven engine idle
Fiat Argenta 120 i.e.



E12

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Injection valves checked for proper operation?

no

Connect the test lead as follows:
The two-pole plug connectors of the test lead are connected between an injection valve and its connecting lead. Of the other two terminals of the test lead, only one must be connected to the special input of the motortester.

Caution!

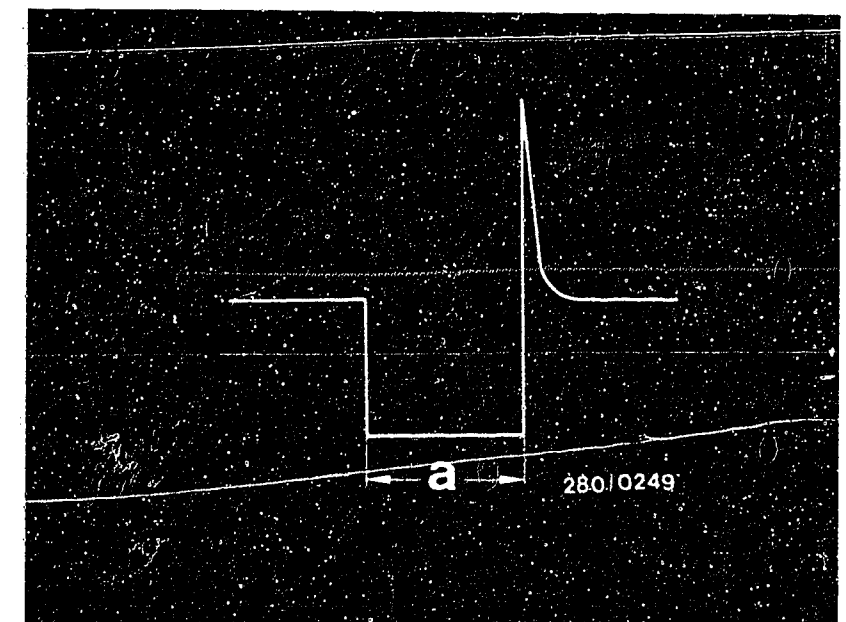
Free terminal must not come into contact with vehicle body.

When the correct terminal is connected, the diagram shown opposite is visible. Using the test lead, the injection pulses at the injection valves can be tested with an ignition oscilloscope with the engine running. If the diagram opposite is not obtained or if there are deviations (interference, missing etc.), the other injection valves should also be tested. In case of interference - check routing of leads.

In case of missing, eliminate loose contacts in leads or in plug-in connections.

yes

Continued on E15/E16



Injection pulses of a switched output stage
(measured at injection valve)
a = Pulse length (dependent on engine load)

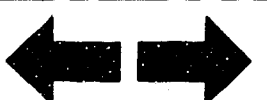
E13

Uneven engine idle
Fiat Argenta 120 i.e.



E14

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Injection valves mechanically and electrically O.K.?

Repair injection valves.

no

With the engine running, disconnect injection valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve is O.K. Test connecting leads from control relay term. 87 to the individual injection valves and from the injection valves to the control unit plug term. 12 for continuity with ohmmeter.

Set value: approx. 0Ω

Resistance of individual injection valves: $15...20\Omega$

Removing the injection valves

Unhook throttle cable. Loosen vacuum hose to ignition trigger box, to econometer, to brake booster and to automatic transmission (if applicable). Unscrew fastening clamp for fuel distribution pipe. Each injection valve is secured with a screw. Loosen this screw.

Caution

Do not lose the washer. Pull all 4 injection valves out of the holes using the fuel distribution pipe.

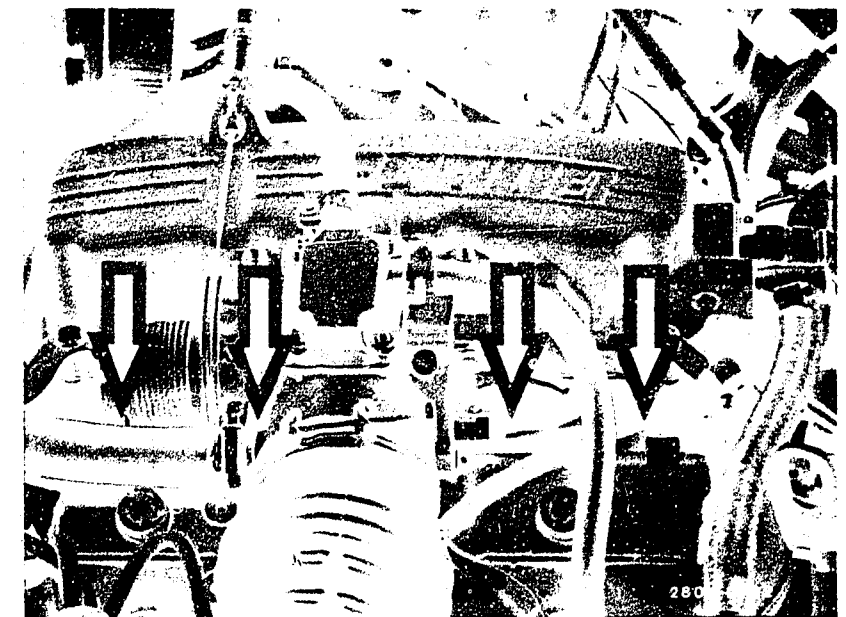
Warning

Pay attention to the rubber seals and the nozzle needles of the injection valves.

yes

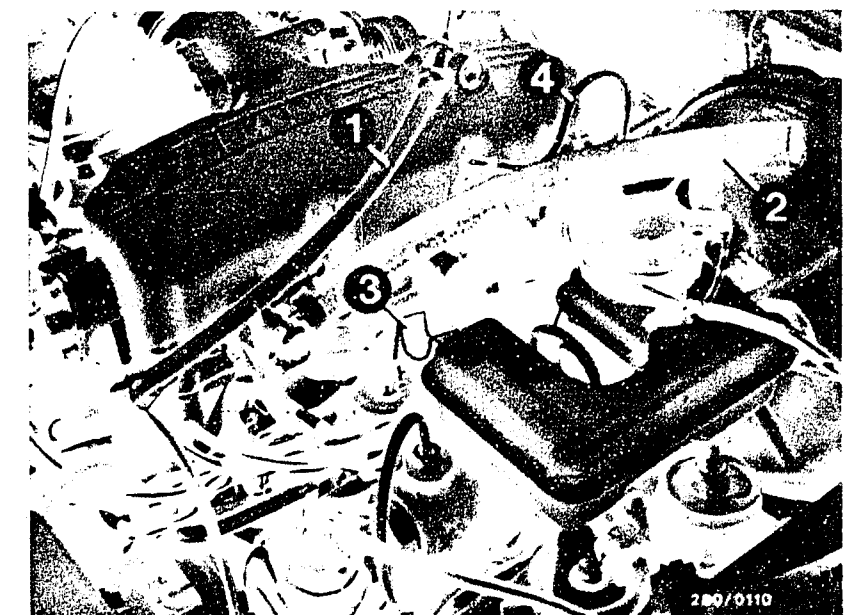
Continued on E21/E22

Continued on E17/E18



Arrow=Injection valves

- 1=Throttle cable
- 2=Vacuum hose
- 3=Fastening clamp
- 4=Vacuum hose to automatic transmission



E15

Uneven engine idle
Fiat Argenta 120 i.e.



E16

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

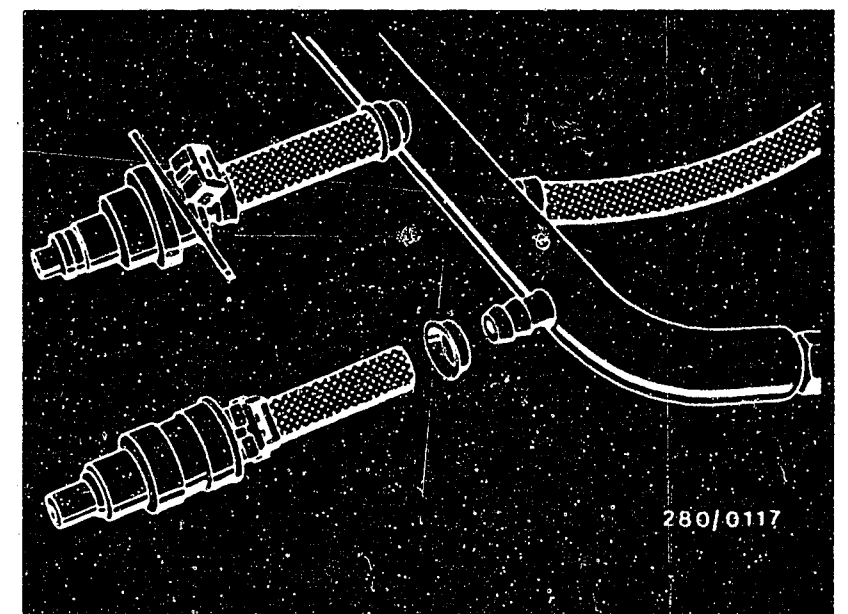
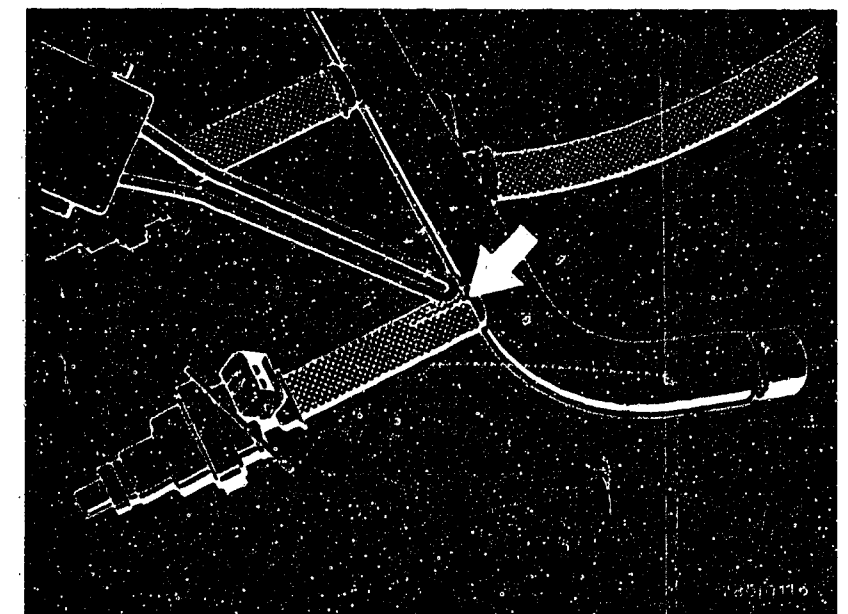
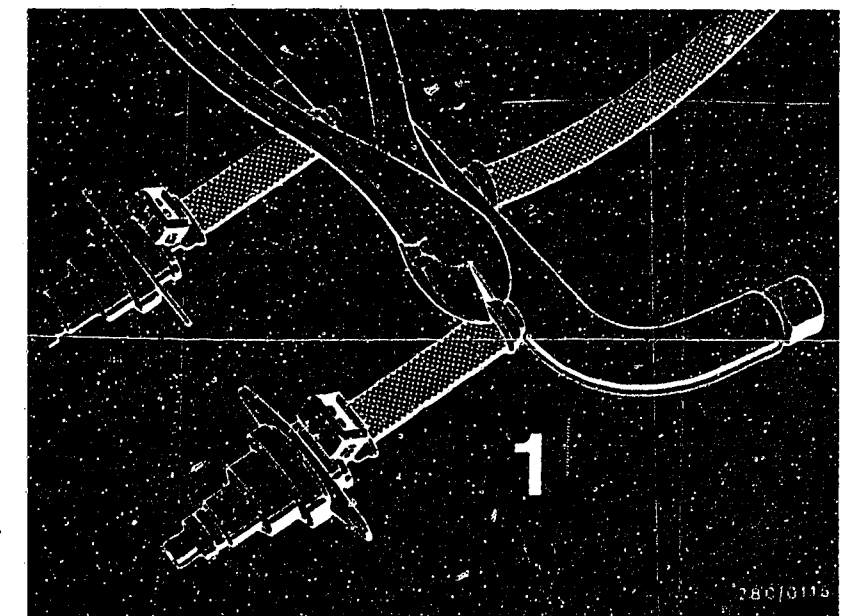
yes

Replacing the injection valves

Break open the hose-termination sleeves (1) of the injection valves.

Cut open fuel hose longitudinally using soldering iron or soldering gun and pull off.

Mount new injection valve with hose-termination sleeve. To do this, wet inside of hose with fuel and push onto fitting as far as it will go. Note installation position of electrical connector.



Continued on E21/E22

Continued on E19/E20

E17

Uneven engine idle

Fiat Argenta 120 i.e.



E18

Uneven engine idle

Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

Installing the injection valves

Ensure proper seating of both rubber seals on each injection valve. Replace defective seals. Press all 4 injection valves uniformly into their seats with the fuel delivery line.

Important: All injection valves must be installed leak-tight. Connect all air/vacuum hoses. Fasten the cup seals of the air-flow sensor.

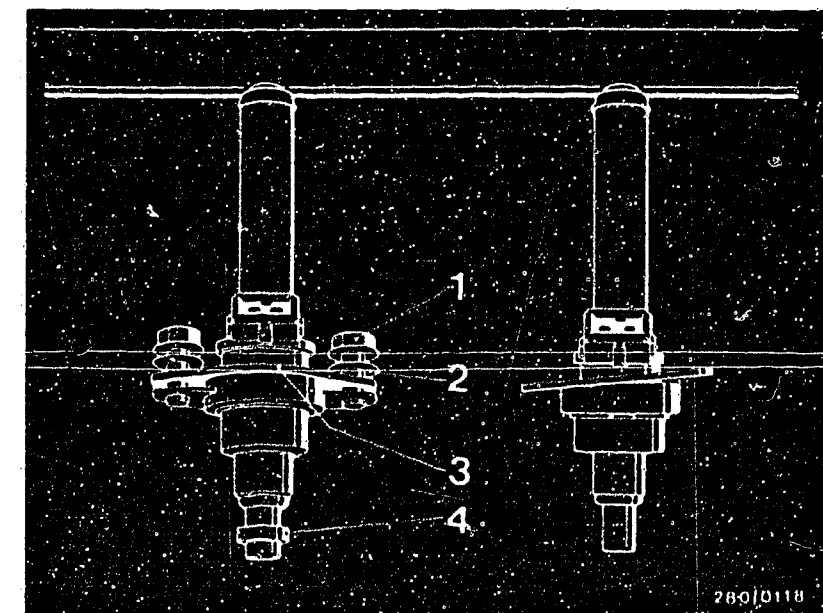
Screw on fastening clamp for fuel distribution pipe. Hook in throttle cable.

Connect vacuum hose to brake booster and automatic transmission.

Re-check all fuel and air hose connections for security. Start engine and check whether any unmetered air is being drawn in.

yes

Continued on E21/E22



- 1=Hexagon screw
- 2=Washer
- 3=Holder
- 4=Rubber ring

E19

Uneven engine idle
Fiat Argenta 120 i.e.



E20

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Air-flow sensor O.K.?

no

yes

Testing:

Unscrew hose between air filter and air-flow sensor.

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close fully again by itself. The air-flow sensor flap must not catch when it is being opened. Watch for signs of abrasion and rubbing. Clean the air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are traces of abrasion or rubbing, replace the air-flow sensor.

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: $160...300\ \Omega$

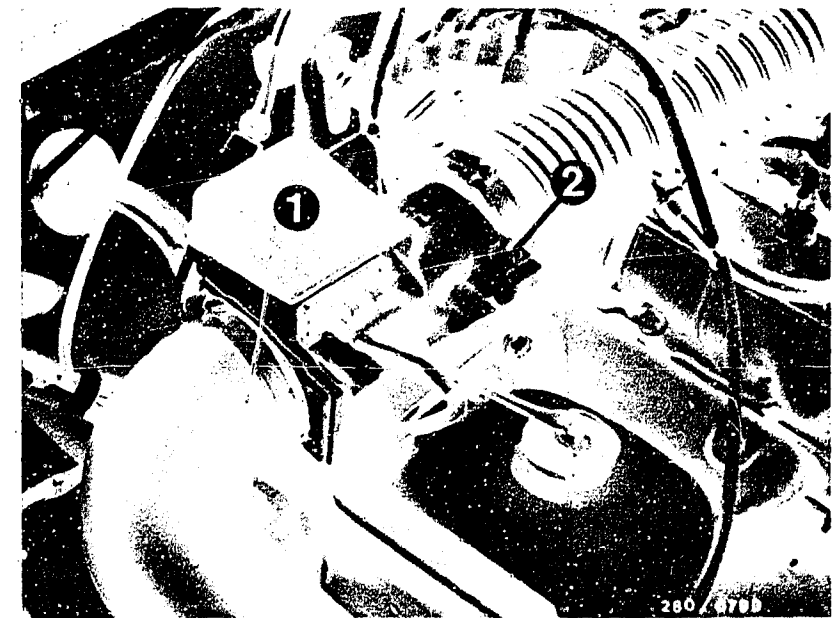
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.

Test specification: $60...1000\ \Omega$

Air-flow sensor flap must return to rest position. If not, the stopper or the air-flow sensor flap is bent. Replace the air-flow sensor.

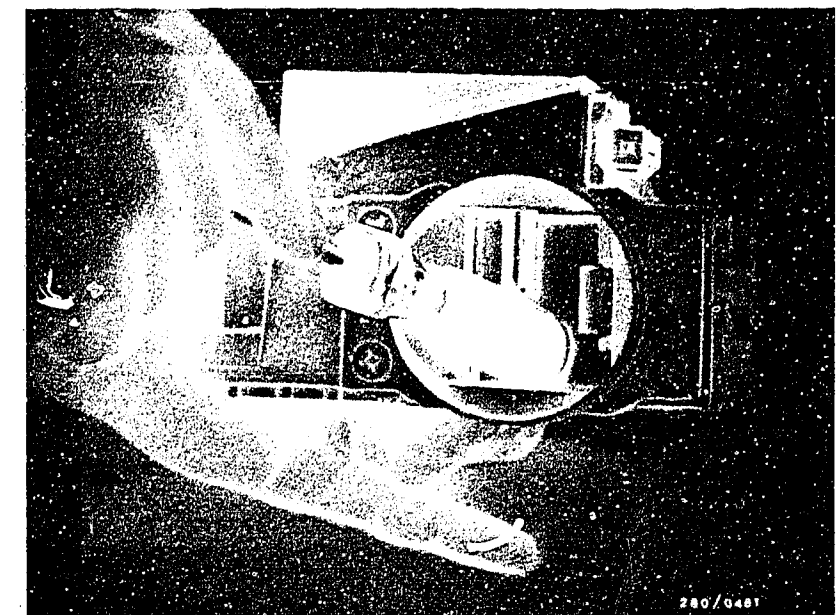
Caution! After testing is completed, refit the hose between air filter and air-flow sensor. Tighten hose clamp.

Continued on E23/E24



1 = Air-flow sensor
2 = CO adjusting screw

Pressing open the air-flow sensor flap.



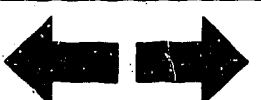
E21

Uneven engine idle
Fiat Argenta 120 i.e.



E22

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

CO and idle speed correctly adjusted? (Repeat?)

no

CO and idle adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed:

Manually-shifted transmission: 800...900 min⁻¹
Automatic transmission (selector lever in position "D" and handbrake on): 700...800 min⁻¹

CO adjustment: 1.5...2.5 % by Vol.CO

If CO concentration too high, turn by-pass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction (hexagon-socket-head cap screw AF5). Check idle speed and CO concentration again. if necessary, make corrections in several steps.

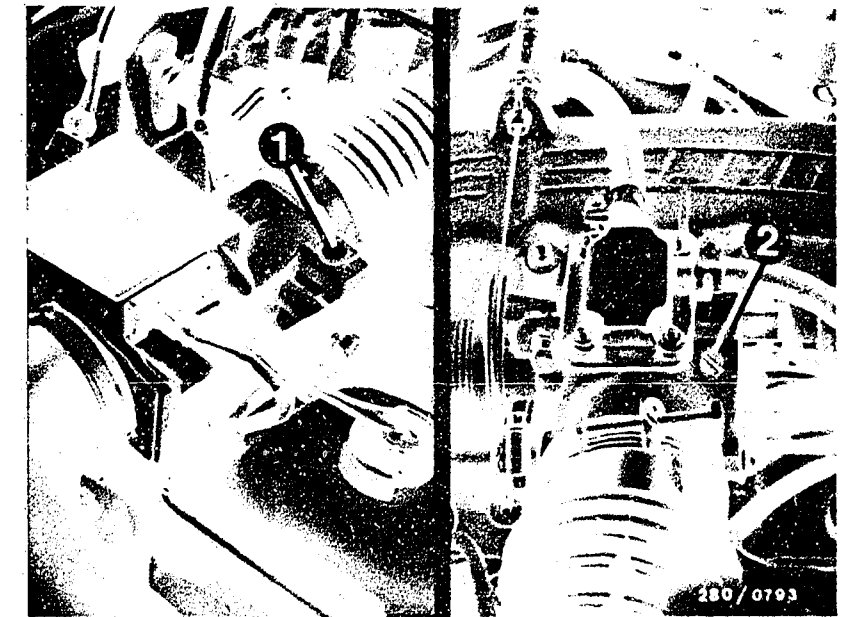
After adjusting, use new (red) plugs (1 280 508 012).

yes

Idle speed not adjustable.

yes

Continued on F1/F2



1=CO adjusting screw
2=Idle adjusting screw

E23

Uneven engine idle
Fiat Argenta 120 i.e.



E24

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Are all hose lines correctly attached, not kinked or damaged?
Visual examination.
Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

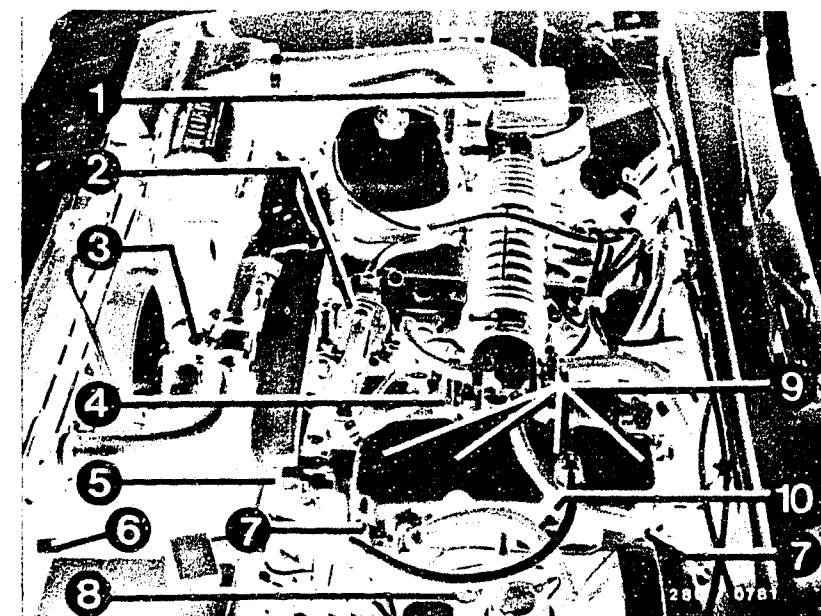
Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Leak test:

Seal off exhaust tail pipe. Unscrew hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and, using compressed-air gun, blow air (0.3 bar gauge pressure) into the intake manifold. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Leaks may also occur at the following points on the engine: Oil dipstick incorrectly inserted, defective oil filler neck lid seal etc. Bubbling or foaming indicates a leak.

yes

Continued on F3/F4



- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

F1

Uneven engine idle
Fiat Argenta 120 i.e.



F2

Uneven engine idle
Fiat Argenta 120 i.e.



Uneven engine idle, incorrect idle speed (continued)

yes

Testing completed for customer complaint

"Uneven engine idle, incorrect idle speed"

Customer complaint remedied?

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).

F3

Uneven engine idle

Fiat Argenta 120 i.e.



F4

Uneven engine idle

Fiat Argenta 120 i.e.



POOR THROTTLE TAKE-UP

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

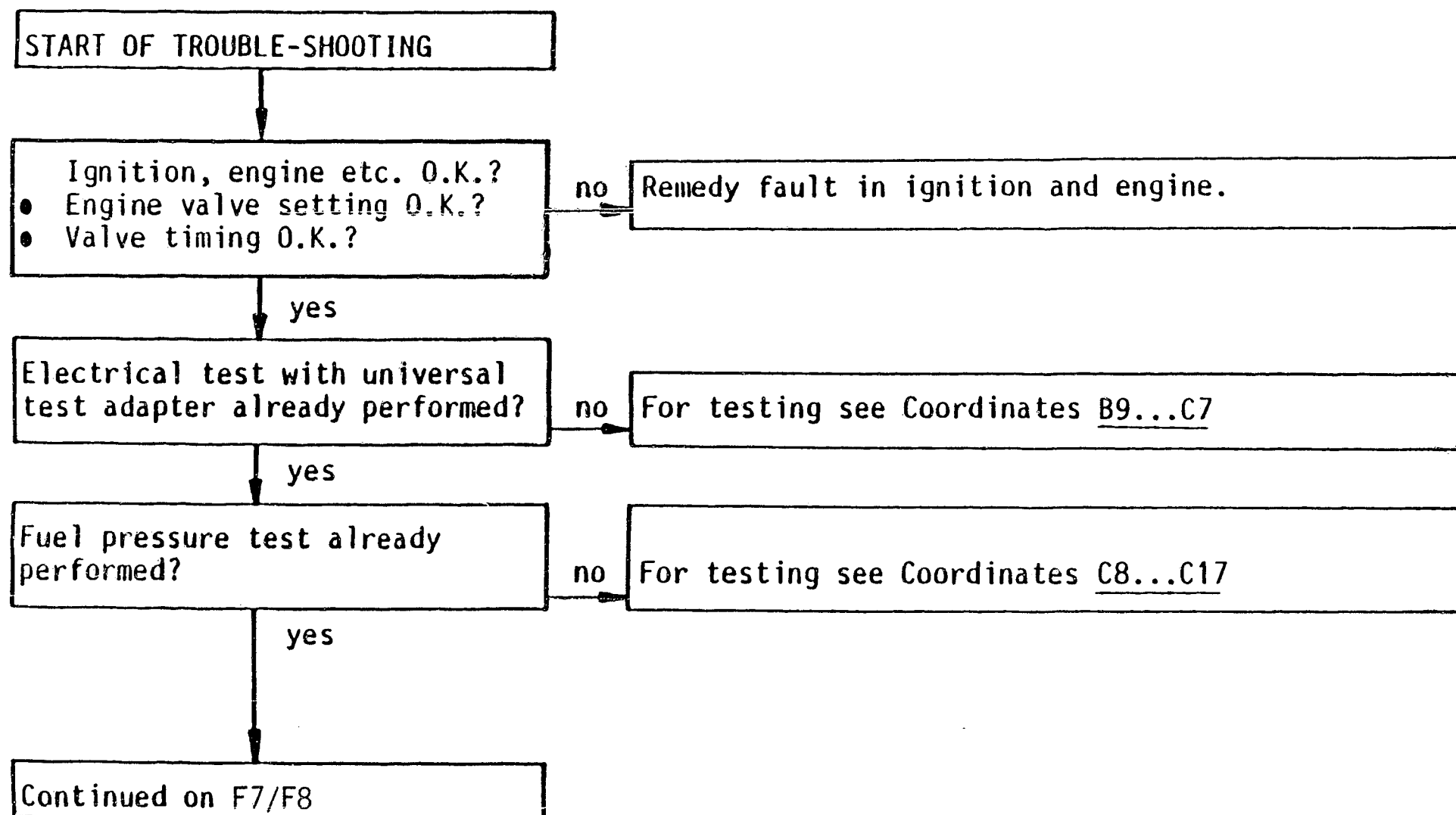
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



F5

Poor throttle take-up
Fiat Argenta 120 i.e.



F6

Poor throttle take-up
Fiat Argenta 120 i.e.



Poor throttle take-up (continued)

yes

Throttle valve closed?

- Throttle lever coming up against stop screw?
- Throttle cable free of tension?
- Throttle cable without kinks?

no

• Testing:

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

• Adjusting the throttle valve:

Throttle valve must come up against the stop screw with the throttle lever just before it sticks. Lock stopscrew with lock nut.

- If throttle cable kinked - replace.

yes

Throttle-valve switch correctly adjusted?

- Idle contact closing?
- Microswitch can be heard to click?

no

• Adjusting the throttle-valve switch

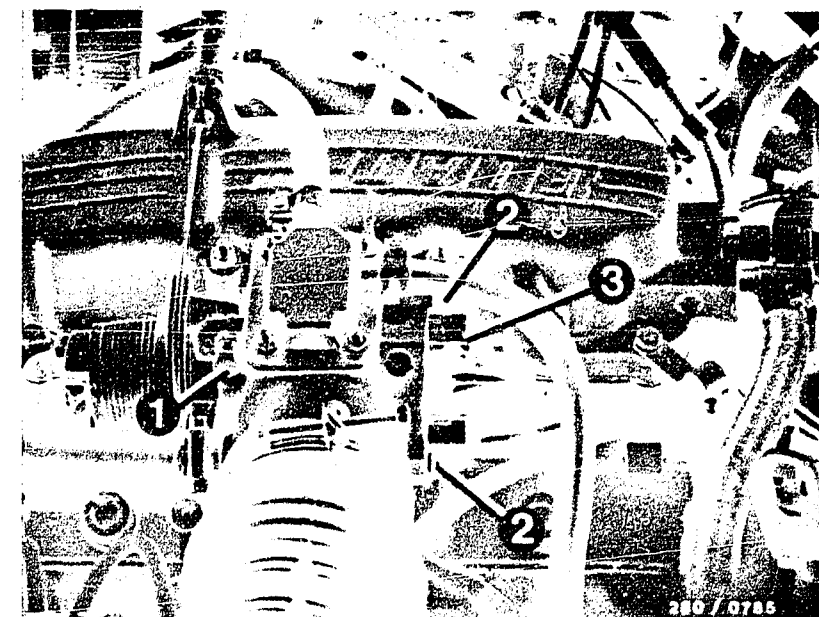
Slightly loosen the throttle-valve switch fastening screws. Connect ohmmeter to throttle-valve switch between term. 2 and term. 18. Turn throttle-valve switch in a clockwise direction until idle contact closes (microswitch can be heard to click)
Reading 0 Ω .

• Checking the adjustment:

Pull slightly on throttle cable. The idle contact opens (microswitch can be heard to click).
Reading $\infty \Omega$.

yes

Continued on F9/F10



1 = Throttle-valve stop screw

2 = Fastening screws

3 = Throttle-valve switch

F7

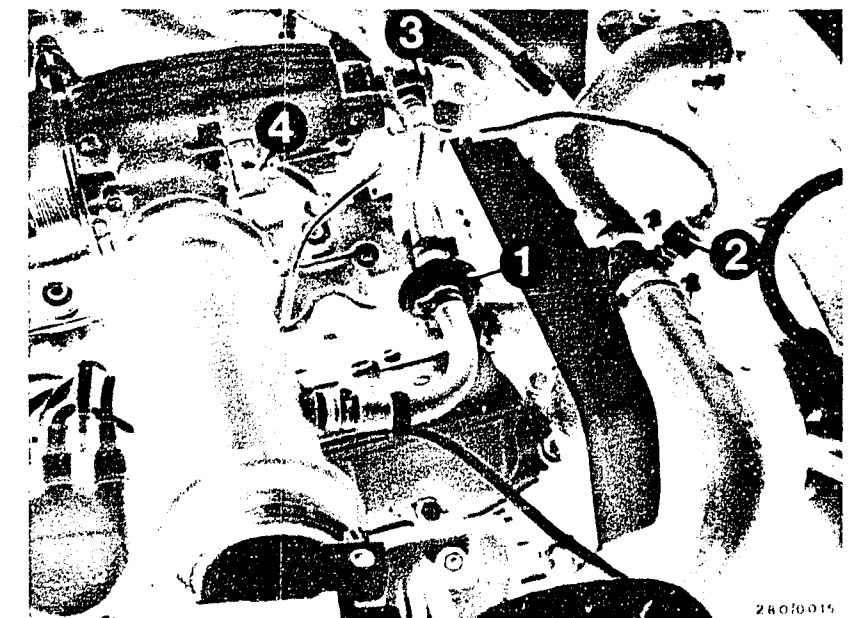
Poor throttle take-up
Fiat Argenta 120 i.e.



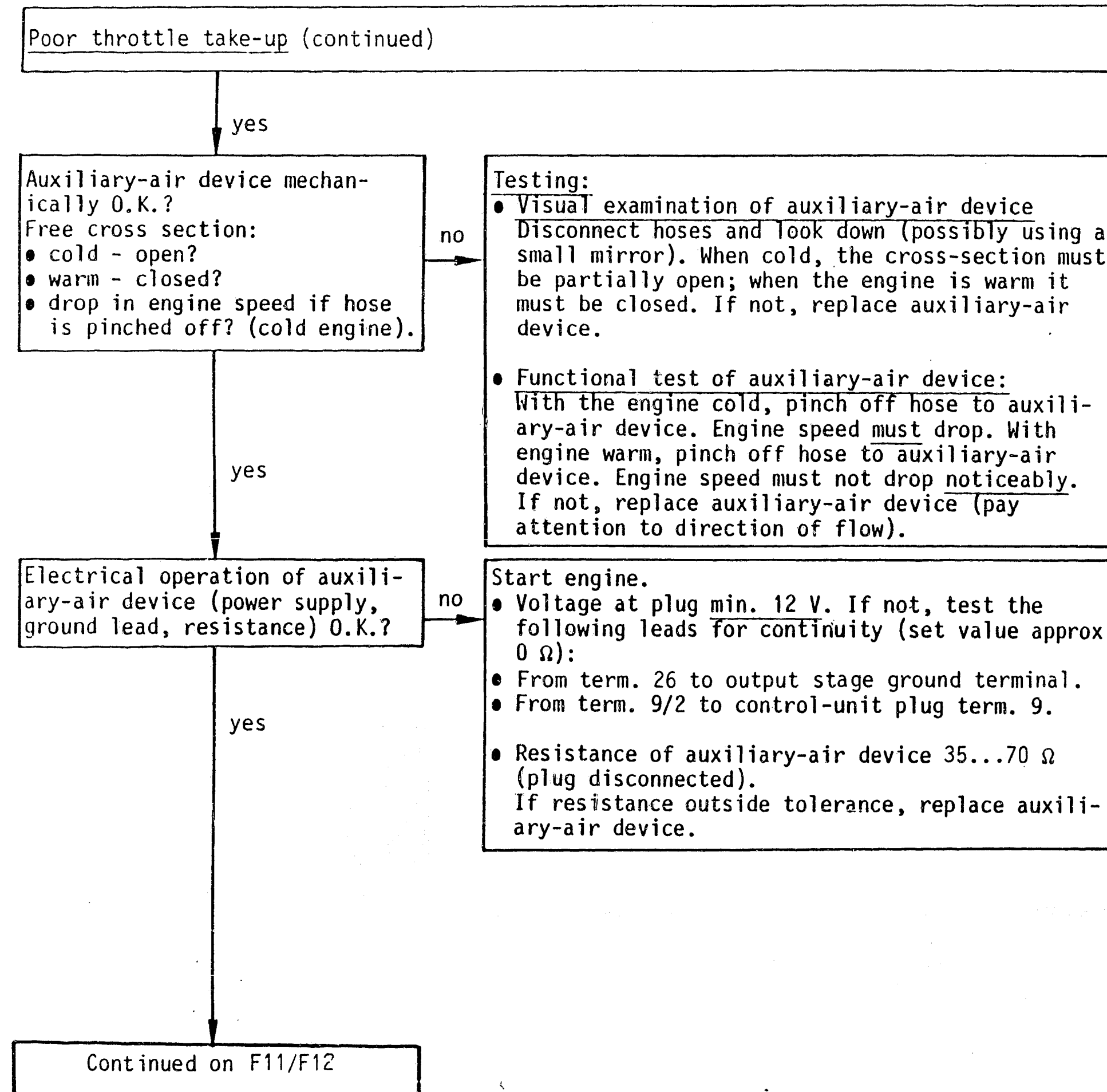
F8

Poor throttle take-up
Fiat Argenta 120 i.e.





1=Auxiliary-air device
2=Temperature sensor II (engine)



F9

Poor throttle take-up
Fiat Argenta 120 i.e.



F10

Poor throttle take-up
Fiat Argenta 120 i.e.



Poor throttle take-up (continued)

yes

Air-flow sensor potentiometer
O.K.?

- Potentiometer wiper track
O.K.?
- Correct stroke signal?

no

Testing:

Unscrew hose between air filter and air-flow sensor.

Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close fully again by itself. The air-flow sensor flap must not catch when it is being opened. Watch for signs of abrasion and rubbing. Clean the air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are traces of abrasion or rubbing, replace the air-flow sensor.

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: $160...300\ \Omega$

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.

Test specification: $60...1000\ \Omega$

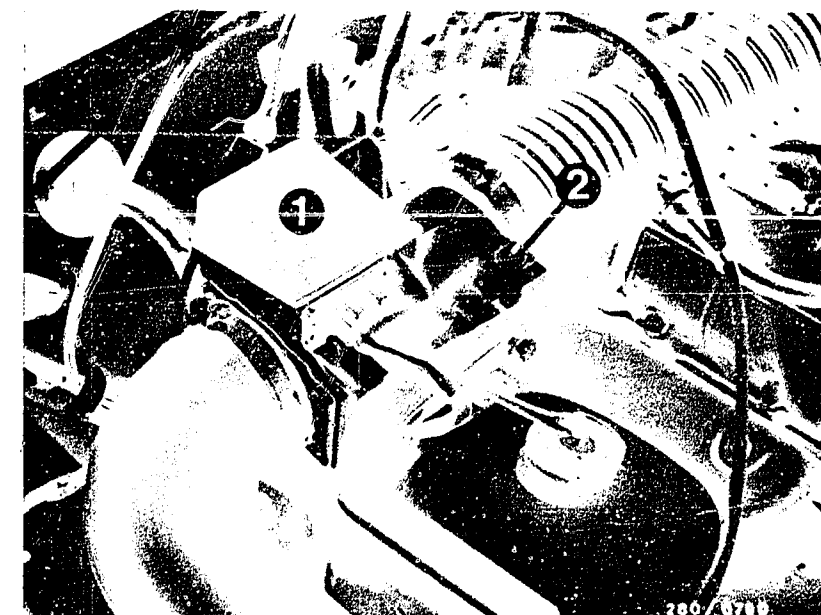
Air-flow sensor flap must return to rest position. If not, the stopper or the air-flow sensor flap is bent. Replace the air-flow sensor.

Caution! After testing is completed, refit the hose between air filter and air-flow sensor.

yes

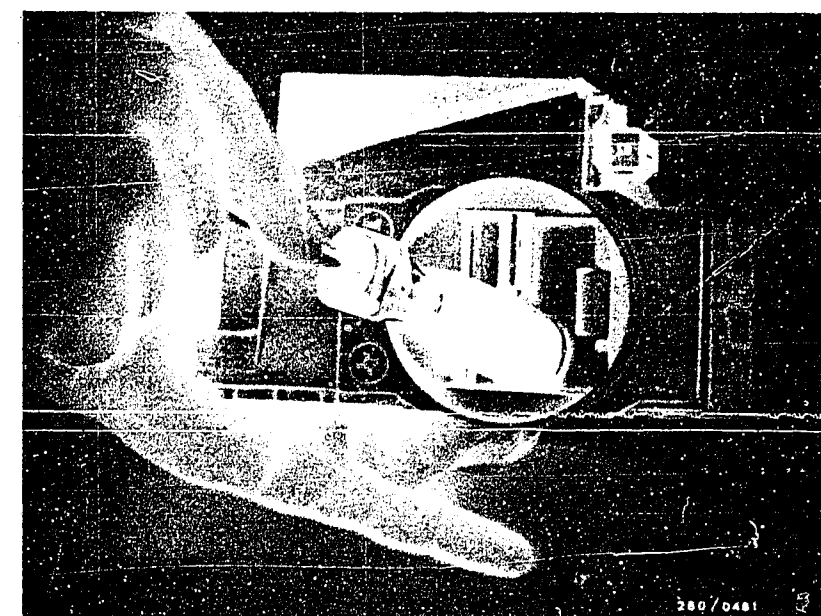
Continued on F17/F18

Continued on F13/F14



1 = Air-flow sensor
2 = CO adjusting screw

Opening air-flow sensor flap.



F11

Poor throttle take-up
Fiat Argenta 120 i.e.



F12

Poor throttle take-up
Fiat Argenta 120 i.e.



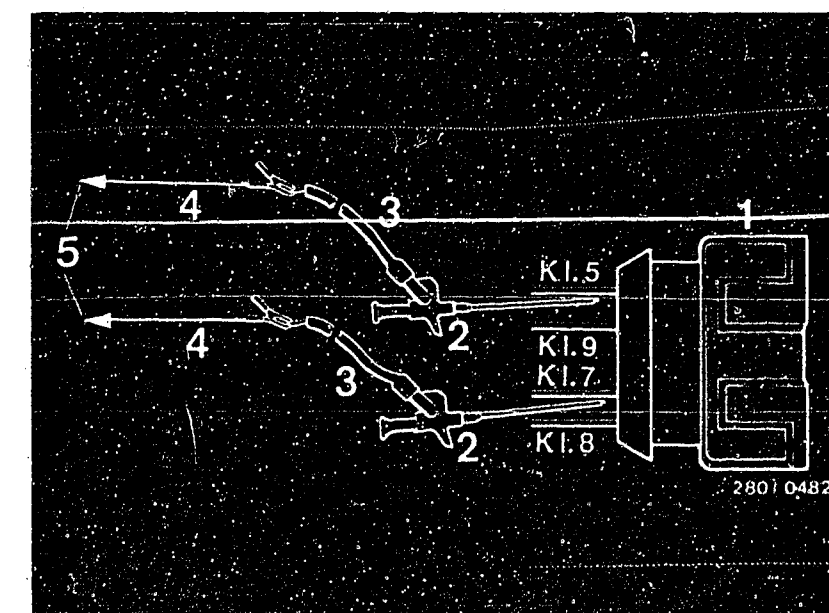
Poor throttle take-up (continued)

yes

Potentiometer test: (Noise test)
 Remove air-flow sensor. (Loosen hose clamps on both sides of air-flow sensor. Loosen air-flow sensor fastening screws; leave plug on). Set motortester to special input and, using special cable, connect to air-flow sensor term. 7 (red clip) and term. 5 (black clip).

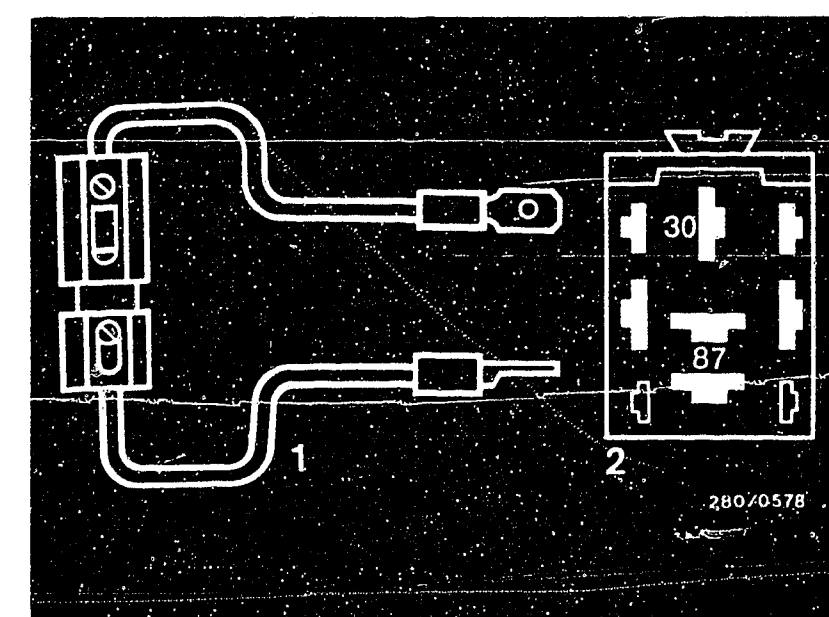
Making the adapter lead:
 User fabrication: Two approx. 1 m long leads, approx. 1.0 mm² diameter. On one end attach 2 test prods, and at the other end strip off approx. 2 cm of insulation and connect to the clamps of the special input connecting lead.

Caution!
 Insulate bare connecting points of adapter lead. (Danger of short circuit). Make careful contact when measuring at the terminals in the plug of the air-flow sensor. Do not bend any contact springs. Set control lever for image adjustment on motortester as far as it will go to the left (calibrated setting). Remove control relay. Fit jumper between term. 87 and term. 30 in connection base. (Power supply for control unit).



- 1 = Air-flow sensor plug
- 2 = Test prod
- 3 = Adapter lead (user-fabricated)
- 4 = Special input connecting lead
- 5 = Motortester special input

- Jumper (user-fabricated)**
- 1 = Fuse holder with 10 A fuse
 - 2 = Top view of connection base



Continued on F17/F18

Continued on F15/F16

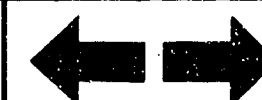
F13

Poor throttle take-up
 Fiat Argenta 120 i.e.



F14

Poor throttle take-up
 Fiat Argenta 120 i.e.



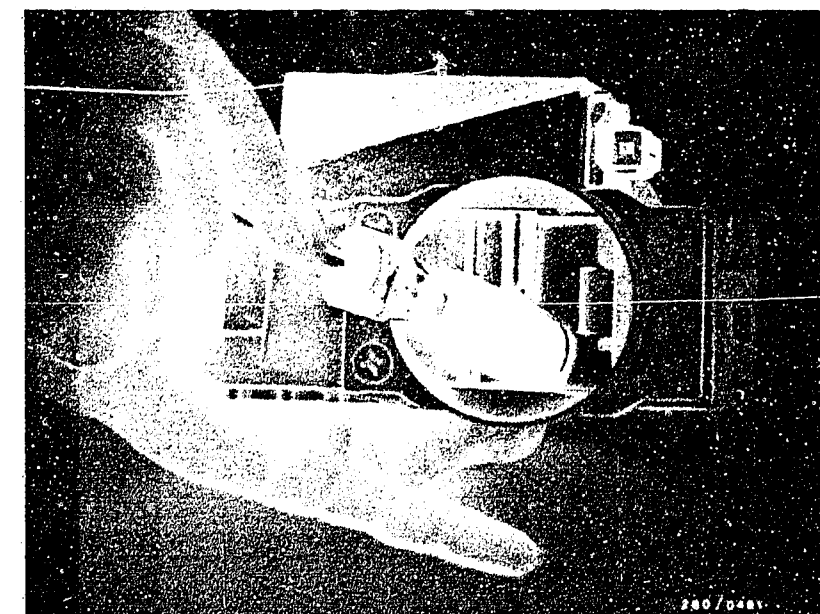
Poor throttle take-up (continued)

- Deflect air-flow sensor flap suddenly several times. If air-flow sensor O.K., a continuous signal must be visible on the oscilloscope. If air-flow sensor defective, there appears a noise signal similar to the one in the diagram opposite. Replace air-flow sensor. Disconnect adapter lead after testing and push on rubber sleeve properly. Mount air-flow sensor. Connect all hoses and tighten (leaks).

Caution! After testing, remove the jumper and connect the control relay.

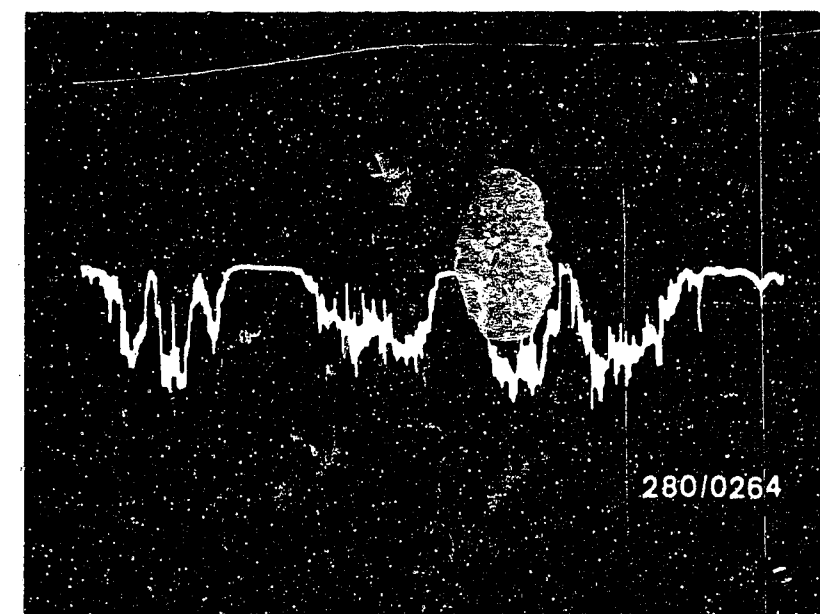
yes

Continued on F17/F18



Opening the air-flow sensor flap.

Noise signal if air-flow sensor defective.



F15

Poor throttle take-up
Fiat Argenta 120 i.e.



F16

Poor throttle take-up
Fiat Argenta 120 i.e.



Poor throttle take-up (continued)

yes

CO and idle speed correctly adjusted?

no

CO and idle adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed:

Manually-shifted transmission: 800...900 min⁻¹
Automatic transmission (selector lever in position "D" and handbrake on): 700...800 min⁻¹

CO adjustment: 1.5...2.5 % by Vol.CO

If CO concentration too high, turn by-pass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction (hexagon-socket-head cap screw AF5). Check idle speed and CO concentration again. if necessary, make corrections in several steps.

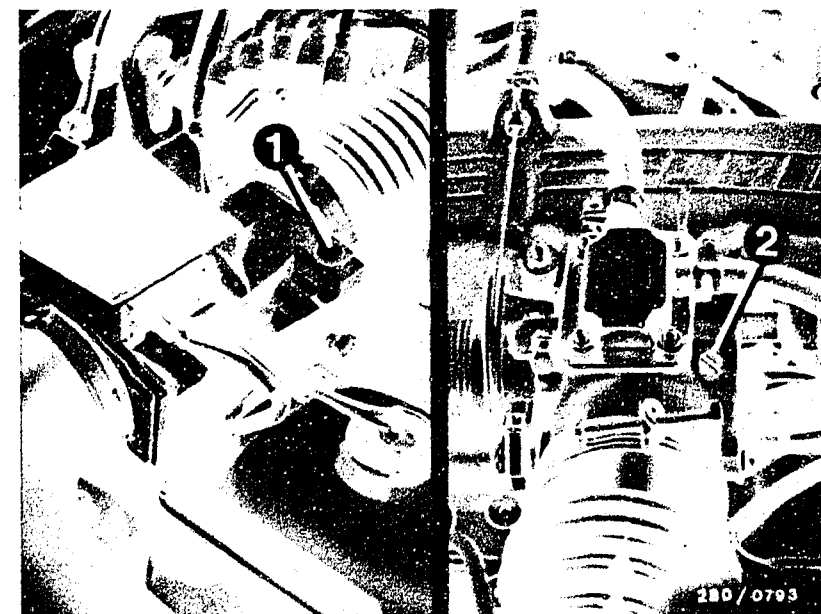
After adjusting, use new (red) plugs (1 280 508 012).

yes

Idle speed not adjustable.

yes

Continued on F19/F20



1=CO adjusting screw
2=Idle adjusting screw

F17

Poor throttle take-up
Fiat Argenta 120 i.e.



F18

Poor throttle take-up
Fiat Argenta 120 i.e.



Poor throttle take-up (continued)

yes

Are all hose lines correctly attached, not kinked or damaged? Visual examination.

- Air-intake system checked for leaks with 0.3 bar gauge pressure?

no

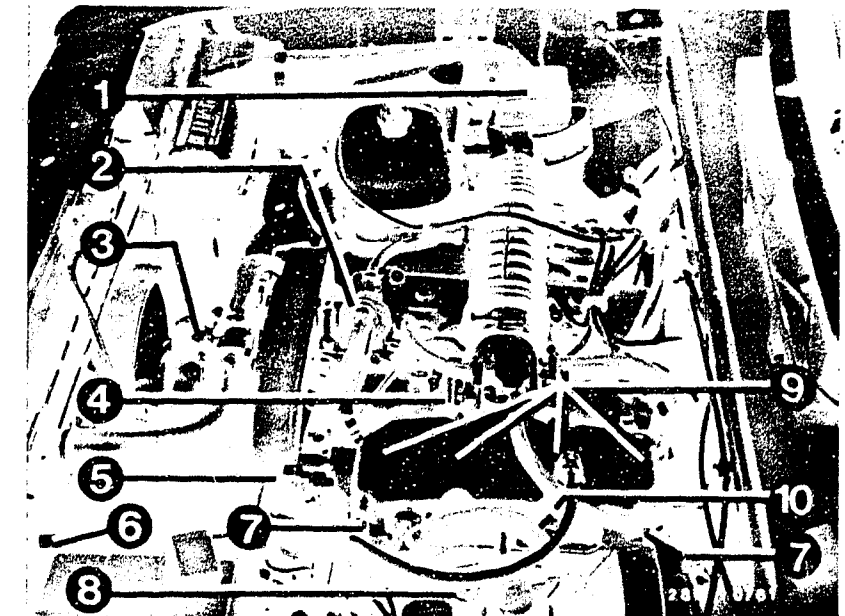
- Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks by means of new seals or by re-tightening the connecting screws.

Leak test:

Seal off exhaust tail pipe.
Unscrew air-flow sensor from air-filter housing and seal off air-flow sensor duct.
Pull off hose after auxiliary air device and, using compressed-air gun, blow air (0,3 bar gauge pressure) into the intake manifold. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Leaks may also occur at the following points on the engine: Oil dipstick incorrectly inserted, defective oil filler neck lid seal etc. Bubbling or foaming indicates a leak.

yes

Continued on F21/F22



- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

F19

Poor throttle take-up
Fiat Argenta 120 i.e.



F20

Poor throttle take-up
Fiat Argenta 120 i.e.



Poor throttle take-up (continued)

yes

Testing completed for customer complaint

"Poor throttle take-up"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).

F21

Poor throttle take-up

Fiat Argenta 120 i.e.



F22

Poor throttle take-up

Fiat Argenta 120 i.e.



ENGINE MISSING UNDER ALL OPERATING CONDITIONS

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

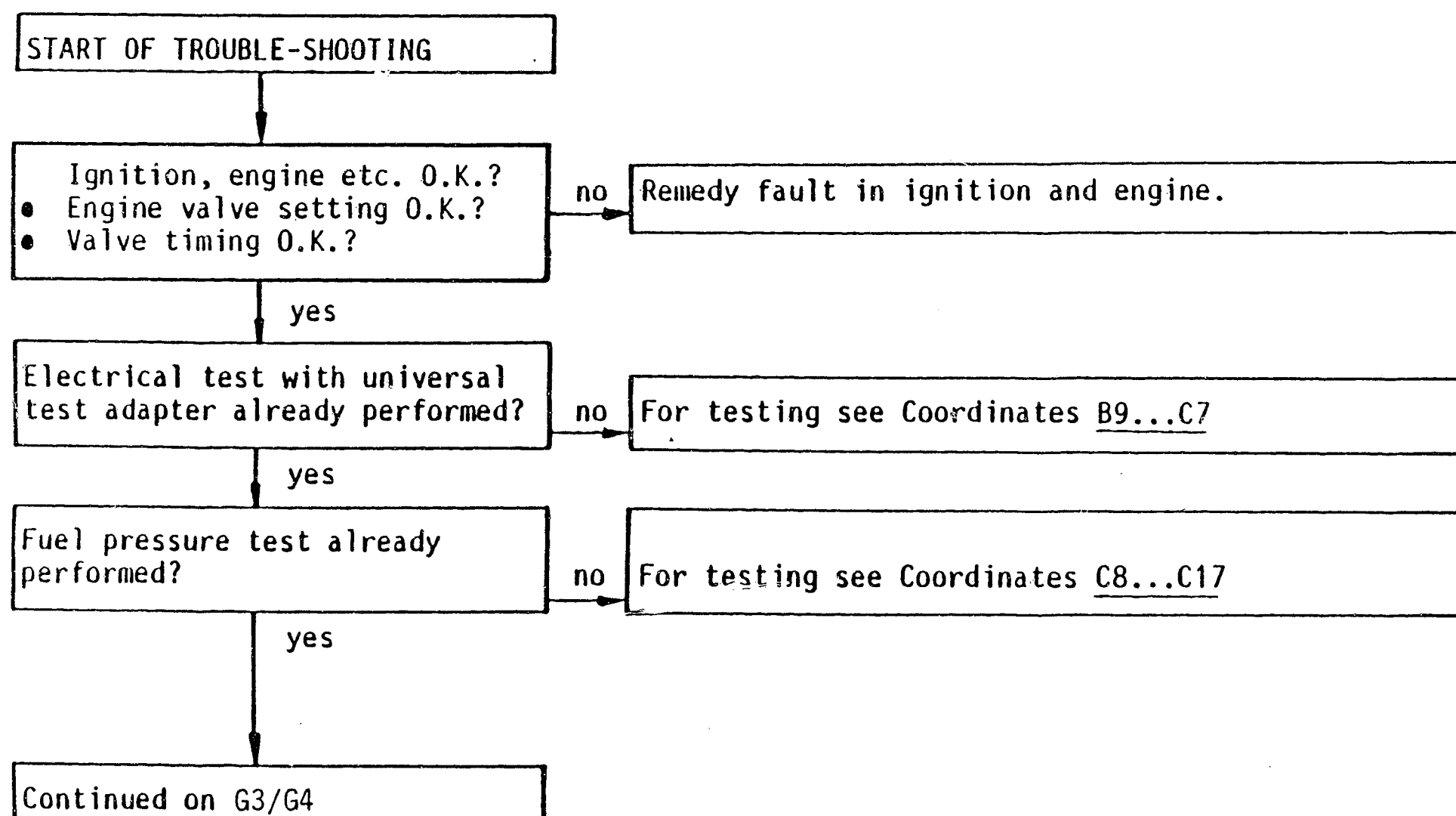
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.

**G1**

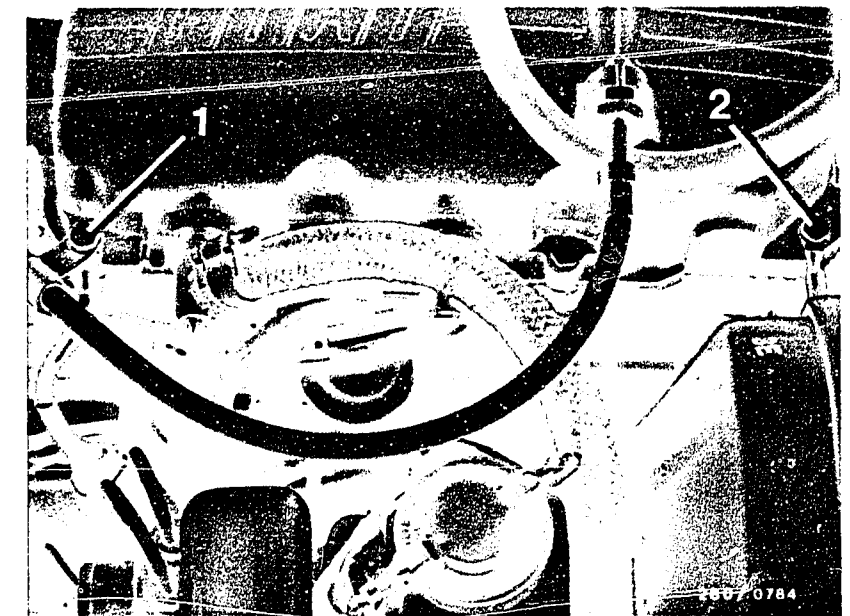
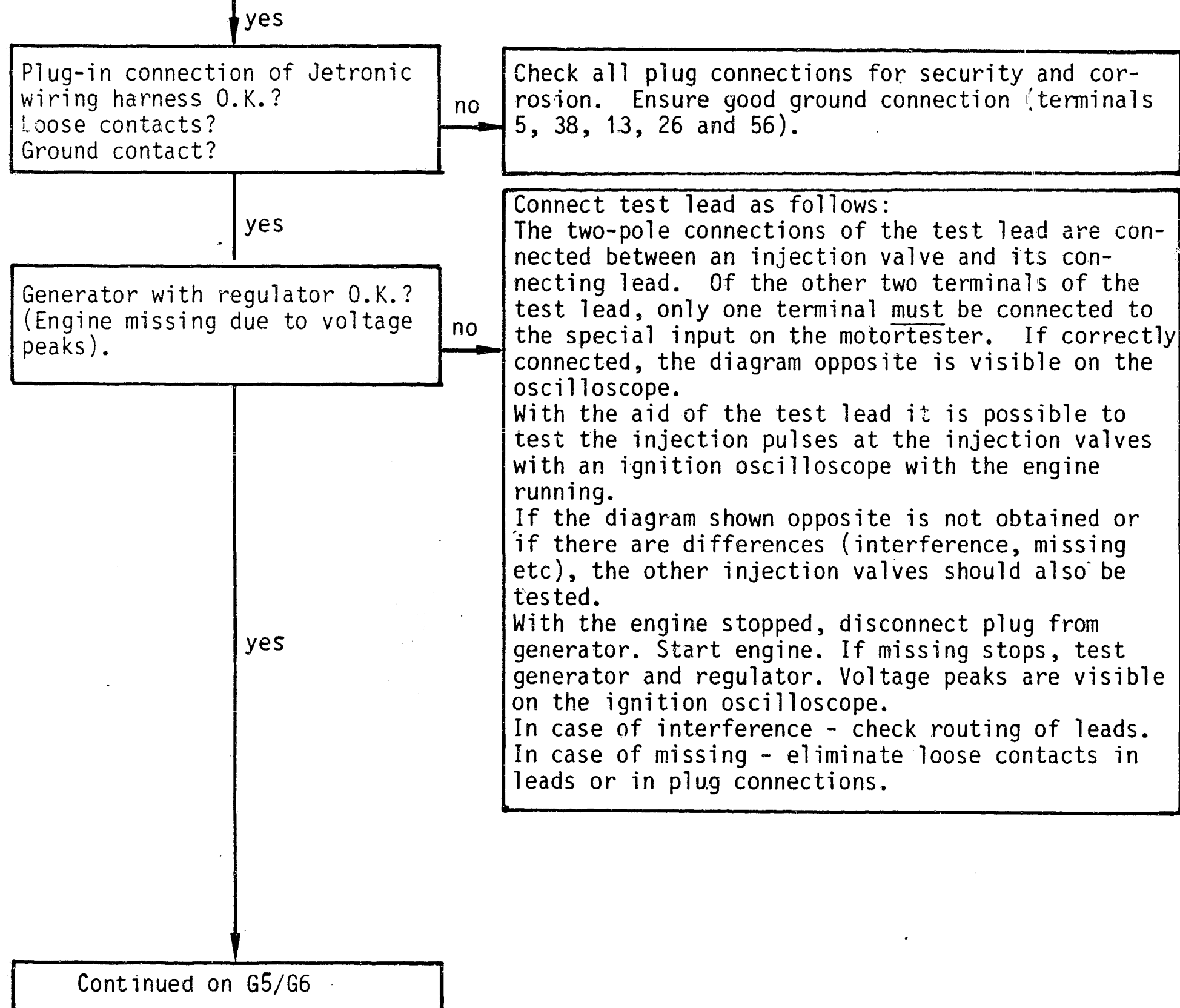
Engine missing
Fiat Argenta 120 i.e.

**G2**

Engine missing
Fiat Argenta 120 i.e.

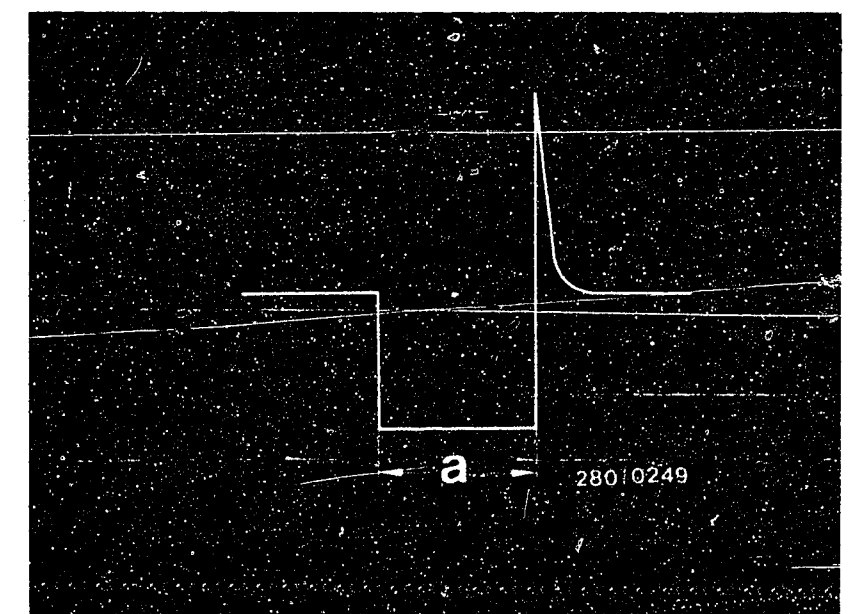


Engine missing under all operating conditions (continued)



1=Electronics ground terminal
2=Output stage ground terminal

Injection pulse of a switched output stage (measured at injection valve)
a=Pulse length (dependent on engine load)



G3

Engine missing
Fiat Agentia 120 i.e.



G4

Engine missing
Fiat Agentia 120 i.e.



Engine missing under all operating conditions (continued)

yes

Air-flow sensor O.K.?

no

Testing:

Unscrew hose between air filter and air-flow sensor.
Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close fully again by itself. The air-flow sensor flap must not catch when it is being opened. Watch for signs of abrasion and rubbing. Clean the air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are traces of abrasion or rubbing, replace the air-flow sensor.

Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: $160...300\ \Omega$

Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.

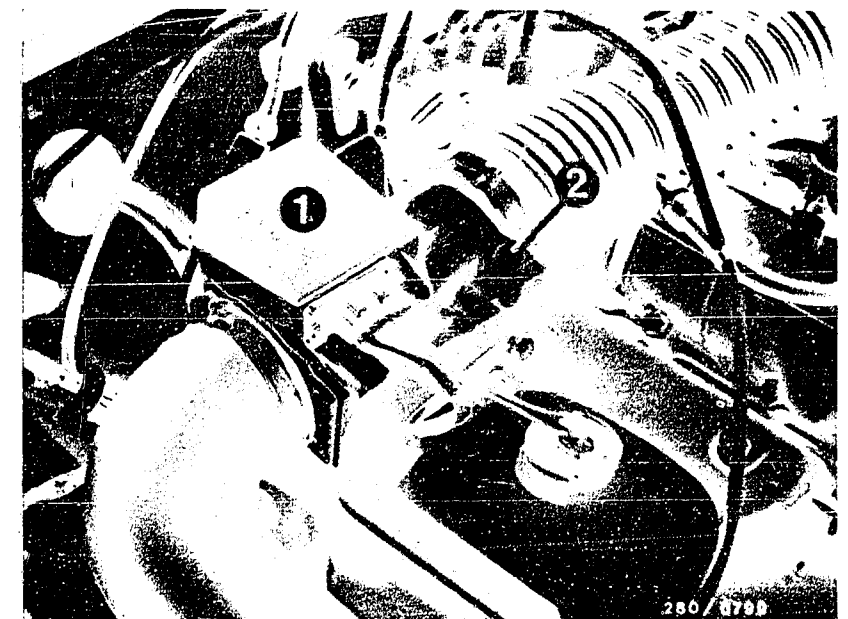
Test specification: $60...1000\ \Omega$

Air-flow sensor flap must return to rest position. If not, the stopper or the air-flow sensor flap is bent. Replace the air-flow sensor.

Caution! After testing is completed, refit the hose between air filter and air-flow sensor.

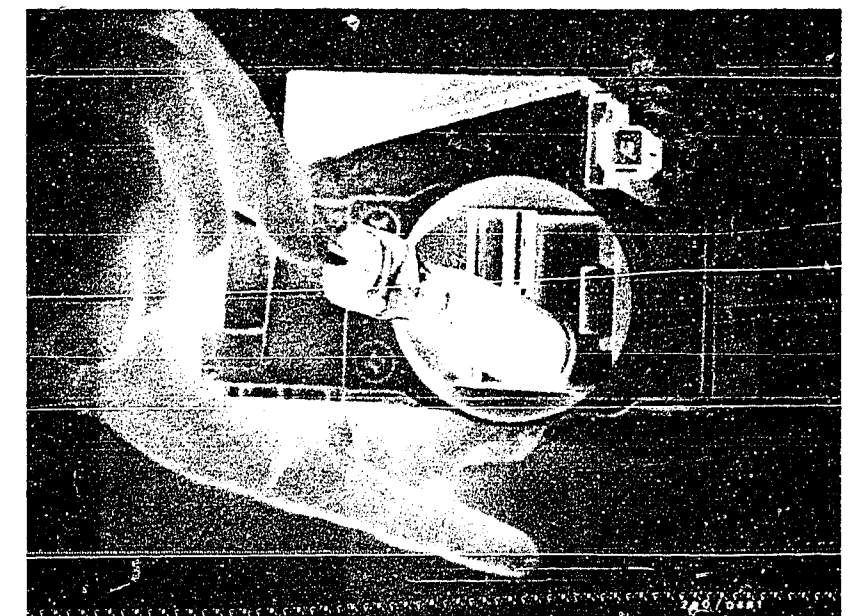
yes

Continued on G7/G8



1 = Air-flow sensor
2 = CO adjusting screw

Opening air-flow sensor flap.



G5

Engine missing
Fiat Argenta 120 i.e.

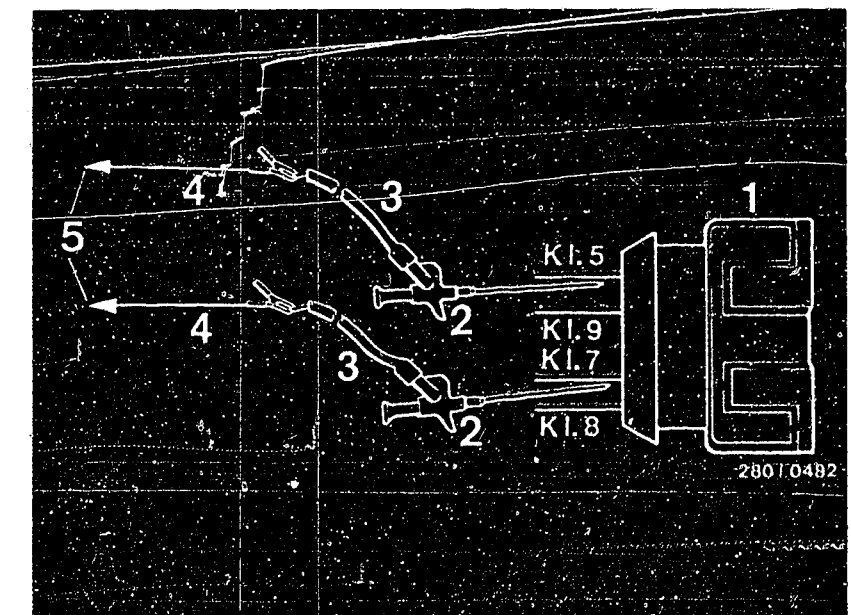
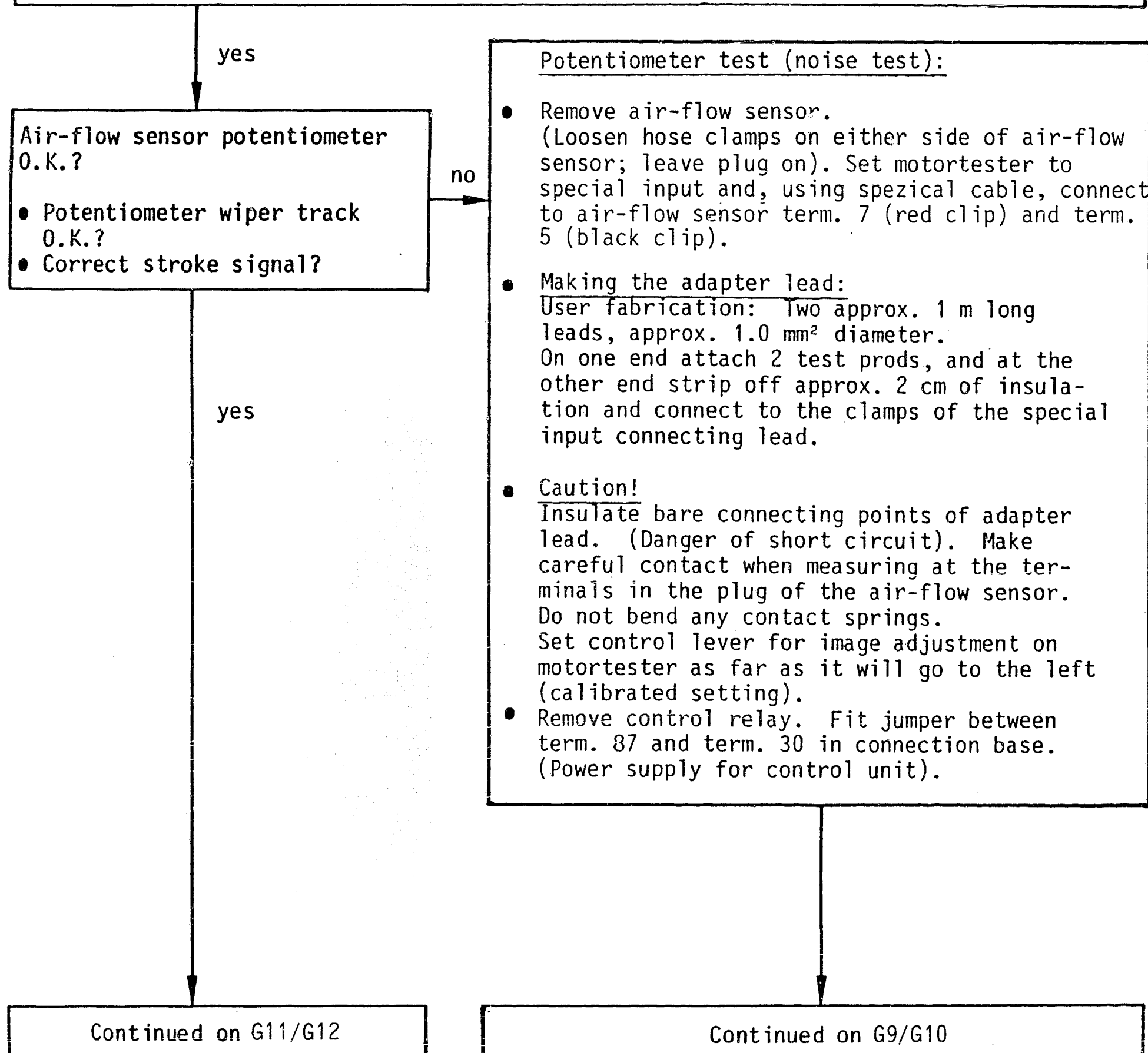


G6

Engine missing
Fiat Argenta 120 i.e.



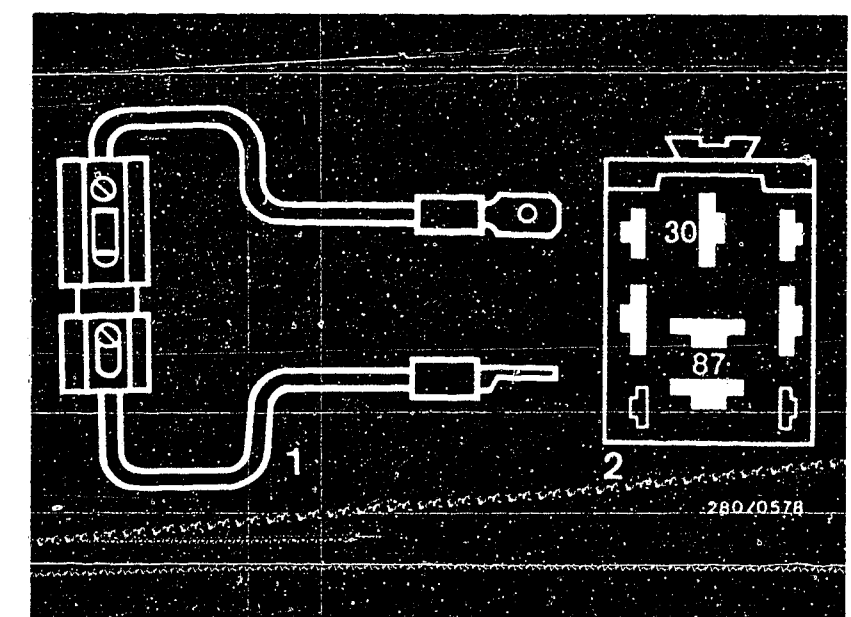
Engine missing under all operating conditions (continued)



- 1 = Air-flow sensor plug
- 2 = Test prod
- 3 = Adapter lead (user-fabricated)
- 4 = Special input connecting lead
- 5 = Motortester special input

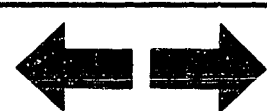
Jumper (user-fabricated)

- 1 = Fuse holder with 10 A fuse
- 2 = Top view of connection base



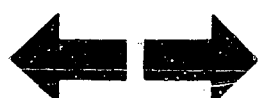
G7

Engine missing
Fiat Argenta 120 i.e.



G8

Engine missing
Fiat Argenta 120 i.e.



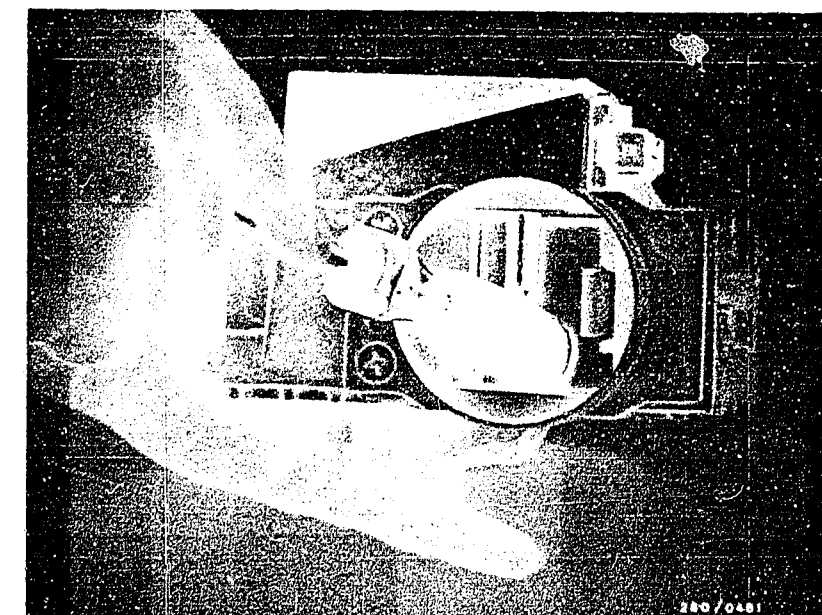
Engine missing under all operating conditions (continued)

- Deflect air-flow sensor flap suddenly several times. If air-flow sensor O.K., a continuous signal must be visible on the oscilloscope. If air-flow sensor defective, there appears a noise signal similar to the one in the diagram opposite. Replace air-flow sensor. Disconnect adapter lead after testing and push on rubber sleeve properly.
Mount air-flow sensor. Connect all hoses and tighten (leaks).

Caution! After testing, remove the jumper and connect the control relay.

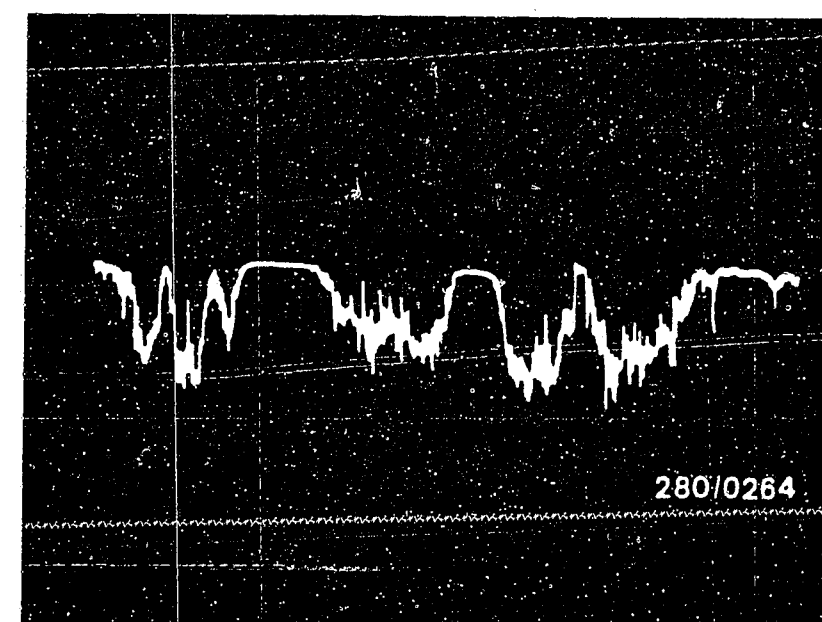
yes

Continued on G11/G12



Opening the air-flow sensor flap.

Noise signal if air-flow sensor defective.



G9

Engine missing
Fiat Argenta 120 i.e.



G10

Engine missing
Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Fuel delivery O.K.?

no

- Measuring the fuel delivery:
For testing, undo junction between fuel return hose (from pressure regulator) and fuel return line (to fuel tank).
If necessary, extend hose and lead into a 5 l vessel with graduated scale.
Disconnect control relay. Insert jumper between term. 87b and term. 30 in connection base.
Electric fuel pump must operate.

Test specification: $675 \text{ cm}^3/30 \text{ s}$

Caution!

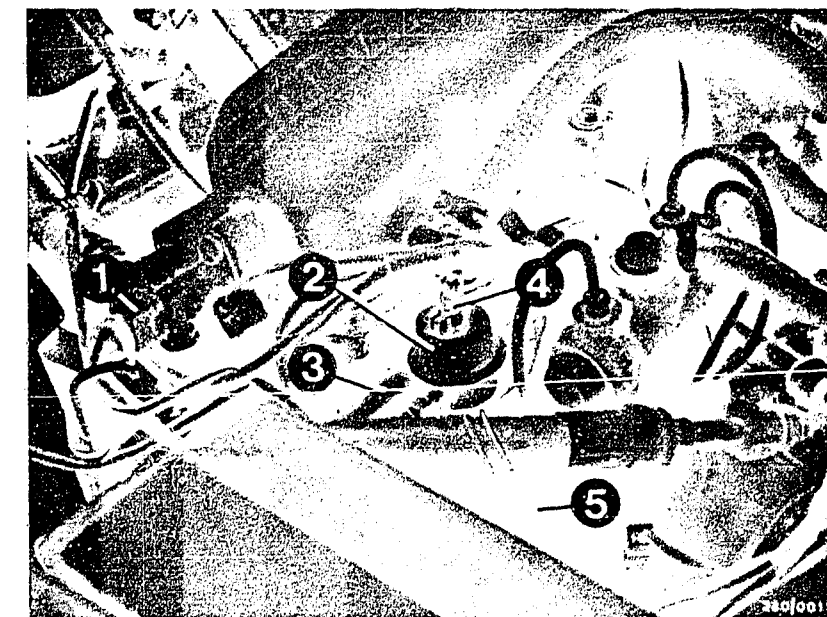
Jumper must be removed again after testing is completed.

Remedy if test specification not reached:

- Fuel filter clogged - replace.
- Voltage at fuel pump plugs with engine running min. 12 V. If not, clean contacts, possibly eliminate poor ground connection, replace leads.
- Pressure regulator defective - replace.
- If fuel pump delivery too low, replace electric fuel pump.

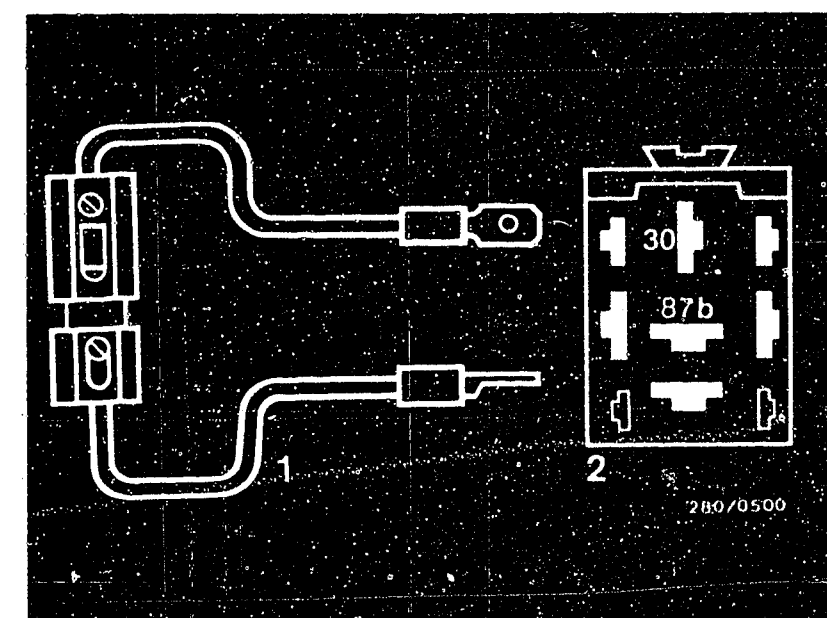
yes

Continued on G13/G14



2 = Pressure regulator
5 = Fuel return line

Jumper (user-fabricated)
1 = Fuse holder with 10 A fuse
2 = Top view of connection base



G11

Engine missing
Fiat Argenta 120 i.e.

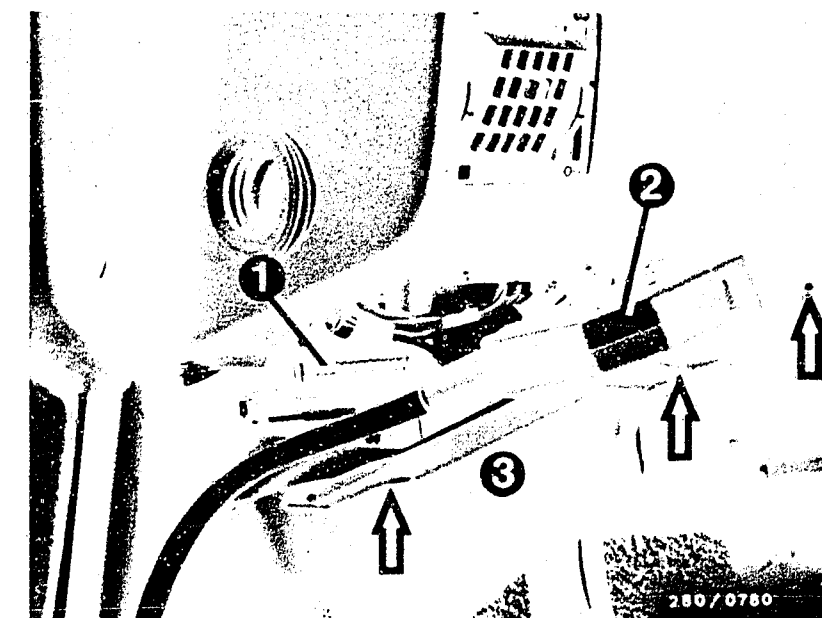
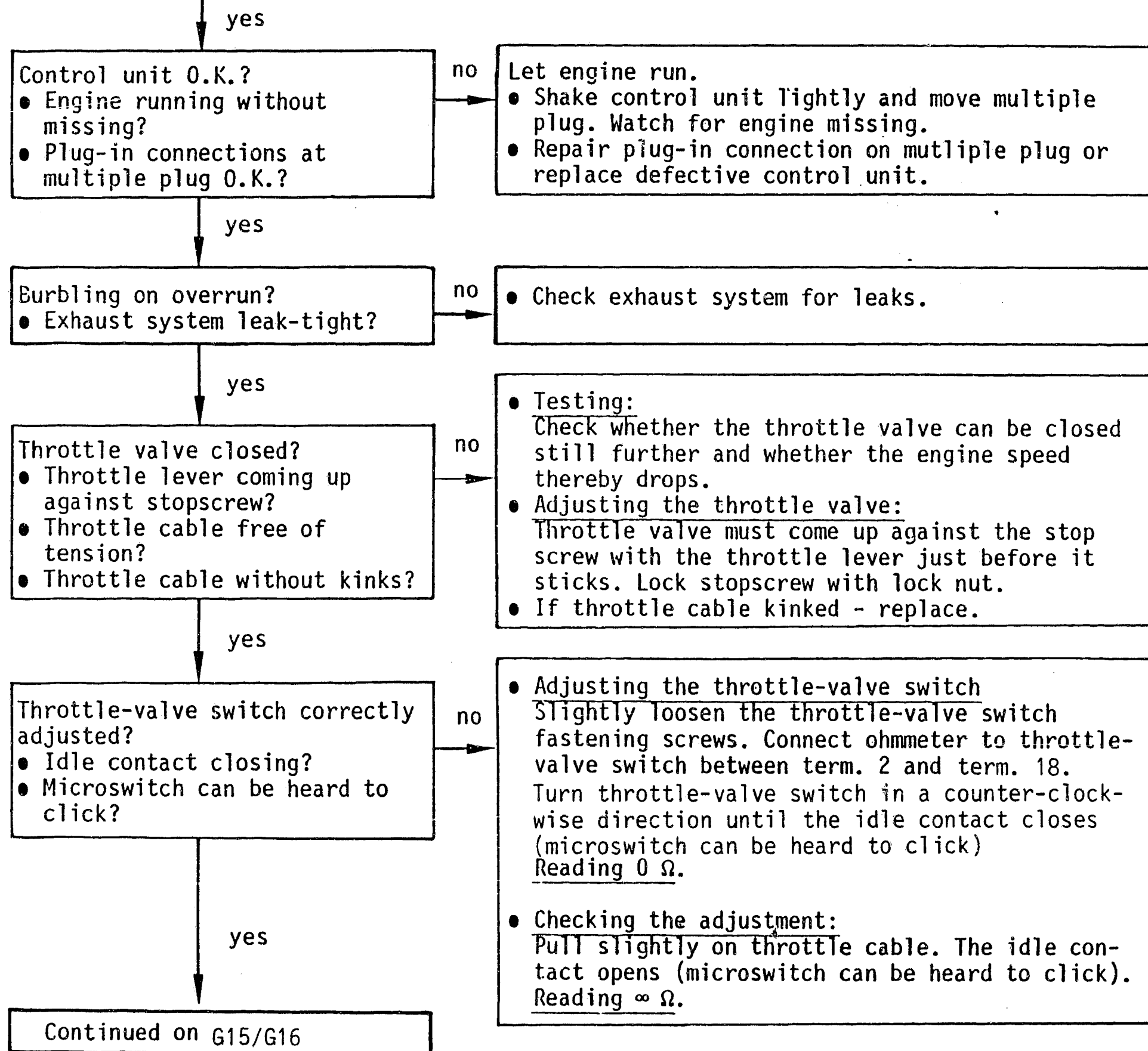


G12

Engine missing
Fiat Argenta 120 i.e.

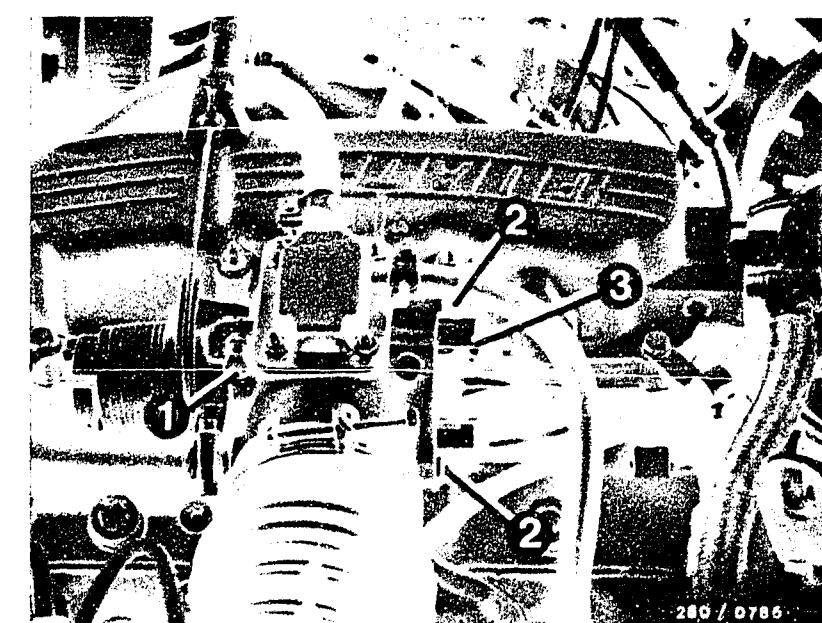


Engine missing under all operating conditions (continued)



1=Control unit
2=LE Adapter lead

1 = Throttle-valve stop screw
2 = Fastening screws
3 = Throttle-valve switch



G 13

Engine missing
Fiat Argenta 120 i.e.



G 14

Engine missing
Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Burbling on overrun?
Overrun cutoff O.K.?

- Operation of control unit O.K.?
- Reinstatement speed O.K.?

cold: 2100 min⁻¹
warm: 1300 min⁻¹

no

• Testing the overrun cutoff

Connect test lead as follows: The two-pole connectors of the test lead are connected between an injection valve and its connecting lead. Of the other two connection clamps of the test lead, only one clamp must be connected to the special input of the motortester. When the correct clamp is connected, the graph shown opposite is visible on the oscilloscope.

Observe oscilloscope.

Slowly raise engine speed to 3000 min⁻¹.

Injection pulses must be visible on the oscilloscope. Foot off accelerator (idle adjustment) No more injection pulses.

Engine clearly below ambient temperature (+15°C ... +30°C):

As of approx. 2000 min⁻¹ injection pulses must be visible again.

The reinstatement speed is approx. 400 min⁻¹ higher.

Engine at normal operating temperature (approx. +80°C):

As of approx. 1250 min⁻¹ injection pulses must be visible again.

The reinstatement speed is approx. 400 min⁻¹ higher.

If incorrect:

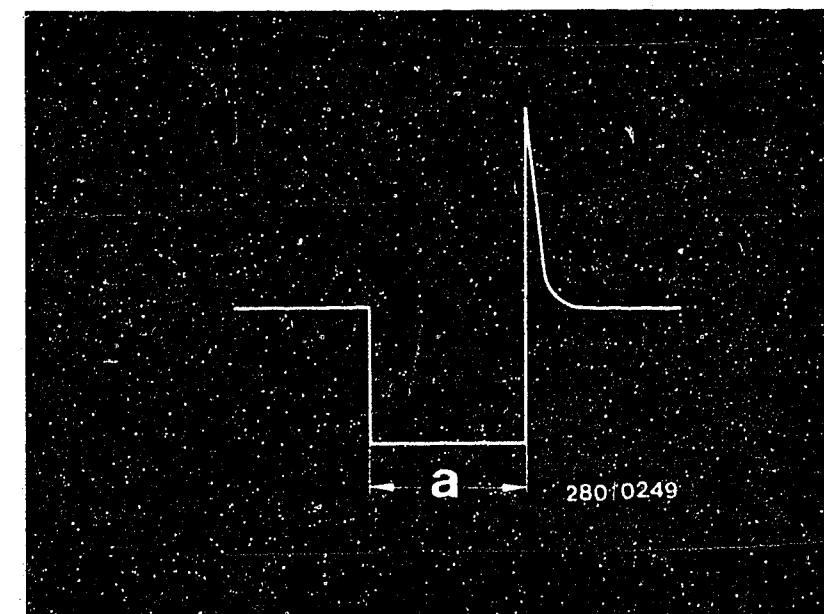
Test leads 2 and 9 for continuity using ohmmeter.

Test switching of idle contact.

If both O.K. → replace control unit.

yes

Continued on G17/G18

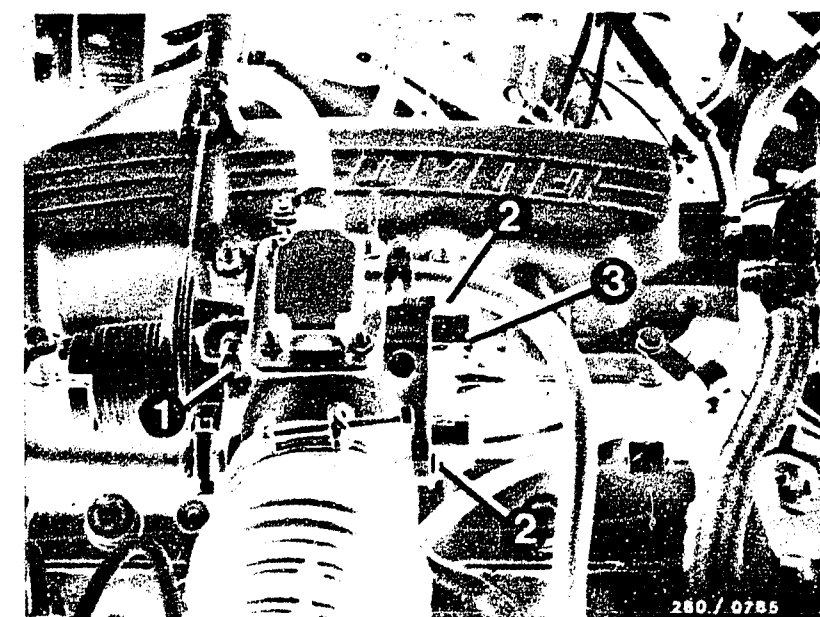


Injection pulse of a switched output stage

(Measured at injection valve)

a = Pulse length (depends on engine load)

3 = Throttle-valve switch



G 15

Engine missing

Fiat Argenta 120 i.e.



G 16

Engine missing

Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Fuel delivery of electric fuel pump O.K. at high temperatures?

No hot delivery problems?

yes

Continued on G19/G20

- CO and idle adjustment
Exhaust-gas adjustment with exhaust gas analyzer with engine at normal operating temperature and at idle speed.
Idle speed:
Manually-shifted transmission: 800...900 min⁻¹
Automatic transmission (selector lever in position "D" and handbrake on): 700...800 min⁻¹
CO adjustment: 1.5...2.5 % by Vol.CO

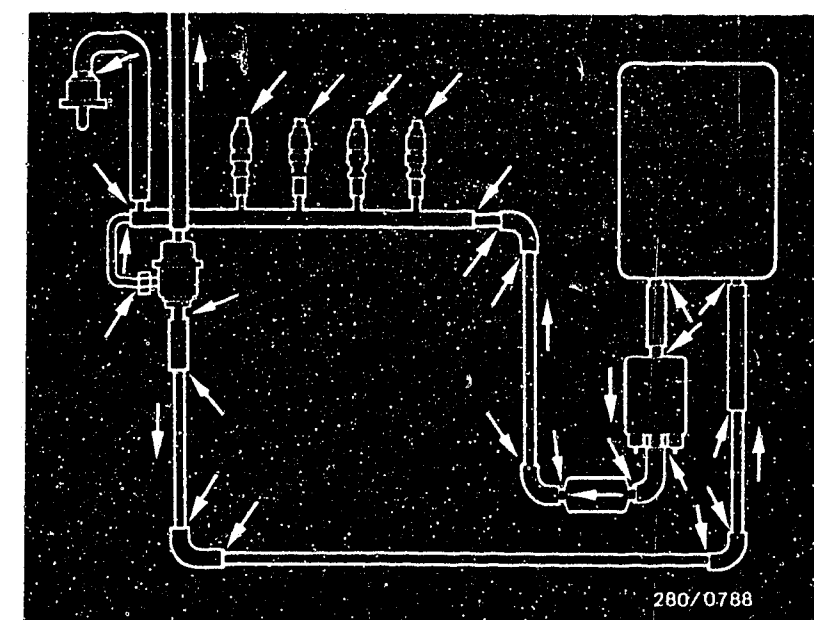
If CO concentration too high, turn by-pass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction (hexagon-socket-head cap screw AF5). Check idle speed and CO concentration again. If necessary, make corrections in several steps.
After adjusting, use new (red) plugs (1 280 508 012).

1. Check the following fuel lines for nicking, pinching and leaks.
 - Fuel intake line
 - Fuel delivery line
 - Fuel distribution pipe
2. Fill up fuel tank. If possible, always drive with full tank.
3. When engine misses, is electric fuel pump still operating? (noises)
 - Provide better cooling of electric fuel pump (ram air). If necessary, replace.
 - Test control relay.
 - Test pump fuse.
4. Test fuel delivery of electric fuel pump.



1=CO adjusting screw
2=Idle adjusting screw

Diagram of fuel lines
Arrows indicate joints between hoses and components



G17

Engine missing
Fiat Argenta 120 i.e.



G18

Engine missing
Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Injection valves tested
for proper operation?
Injection signal exam-
ined for missing?

no

Connect test lead as follows:
The two-pole connectors of the test lead
are connected between an injection valve
and its connecting lead. Of the other two
connection clamps of the test lead, only
one clamp must be connected to the special
input of the motortester.

If the correct clamp is connected, the
picture shown opposite is visible on the
oscilloscope.

With the aid of the test lead it is pos-
sible with an ignition oscilloscope to
test the injection pulses at the injection
valves with the engine running.

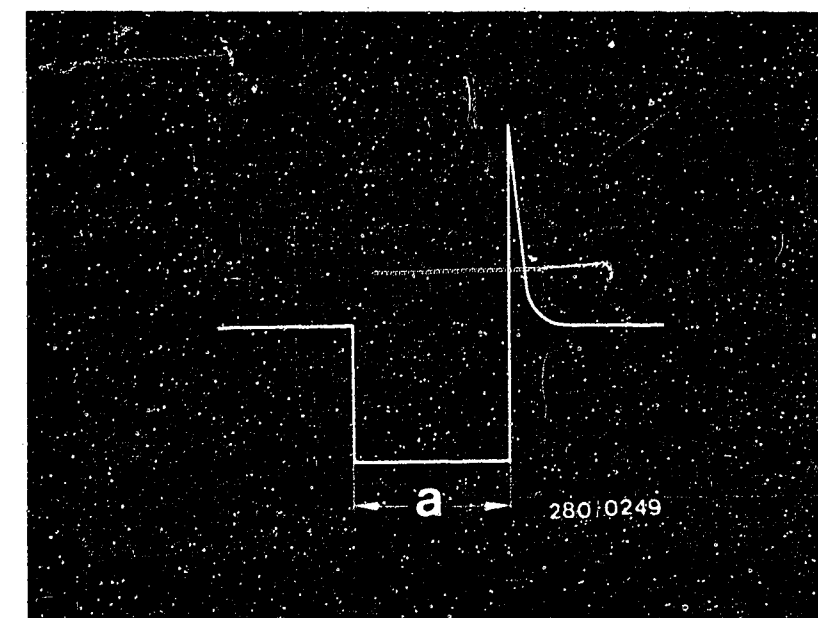
If the picture shown opposite is not
visible or if there are deviations (inter-
ference, missing etc), the other injection
valves should also be examined.

In case of interference → check routing of
leads.

In case of missing → eliminate loose con-
tacts in leads or in plug-in connections.

yes

Continued on G21/G22



Injection pulse of a switched
output stage

(Measured at injection valve)

a = Length of regulation
(dependent on engine load)

G 19

Engine missing

Fiat Argenta 120 i.e.



G 20

Engine missing

Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Injection valves mechanically O.K.?

- Does engine speed drop when injection-valve connectors are pulled off individually?
- Repair injection valves.

no

With the engine running, disconnect injection valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve is O.K. Test connecting leads from control relay term. 87 to the individual injection valves and from the injection valves to the control unit plug, term. 12 for continuity with ohmmeter.

Set value:

approx. 0Ω

Resistance of individual injection valves: $15...20\Omega$

Removing the injection valves

Unhook throttle cable. Loosen vacuum hose to ignition trigger box, to econometer, to brake booster and to automatic transmission (if applicable). Unscrew fastening clamp for fuel distribution pipe. Each injection valve is secured with a screw. Loosen this screw.

Caution

Do not lose the washer. Pull all 4 injection valves out of the holes using the fuel distribution pipe.

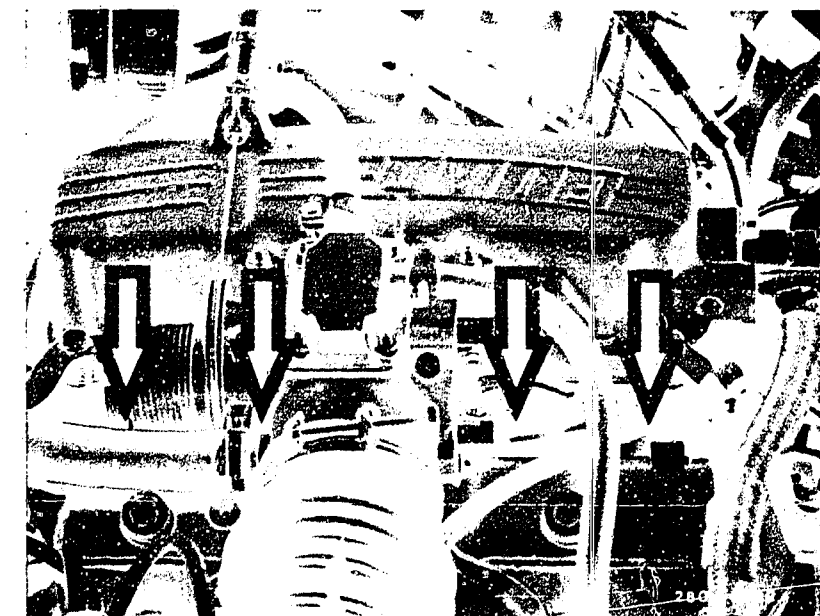
Warning

Pay attention to the rubber seals and the nozzle needles of the injection valves.

yes

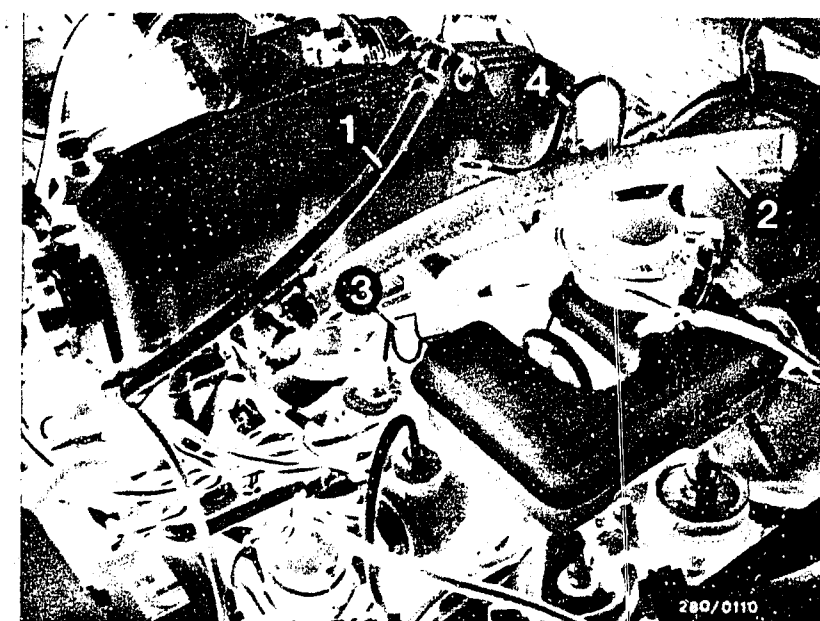
Continued on H1/H2

Continued on G23/G24



Arrow=Injection valves

- 1=Throttle cable
- 2=Vacuum hose
- 3=Fastening clamp
- 4=Vacuum hose to automatic transmission



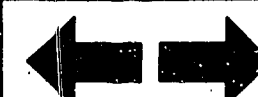
G21

Engine missing
Fiat Argenta 120 i.e.



G22

Engine missing
Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

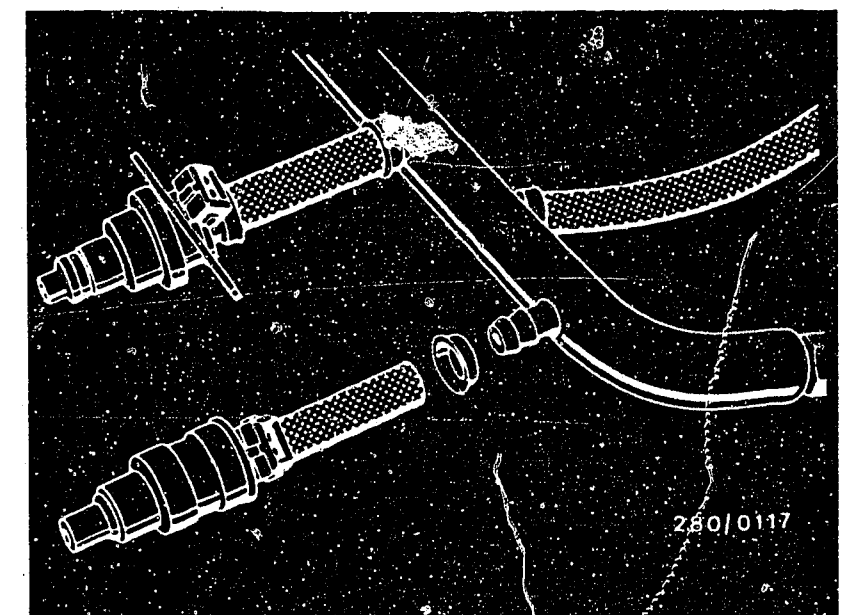
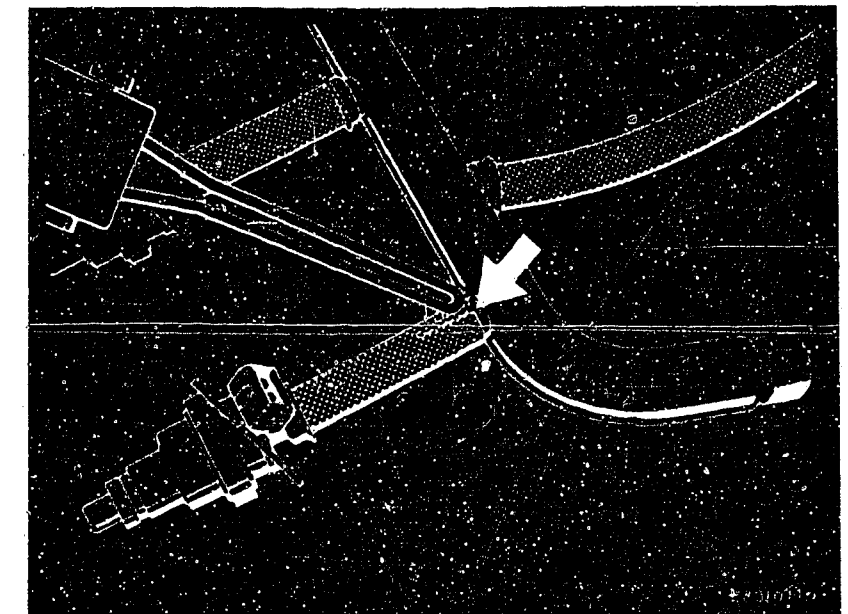
Replacing the injection valves

Break open the hose-termination sleeves (1) of the injection valves.

Cut open fuel hose longitudinally using soldering iron or soldering gun and pull off.

Mount new injection valve with hose-termination sleeve. To do this, wet inside of hose with fuel and push onto fitting as far as it will go. Note installation position of electrical connector.

Continued on H1/H2



G23

Engine missing
Fiat Argenta 120 i.e.



G24

Engine missing
Fiat Argenta 120 i.e.



Engine missing under all operating conditions (continued)

yes

Installing the injection valves

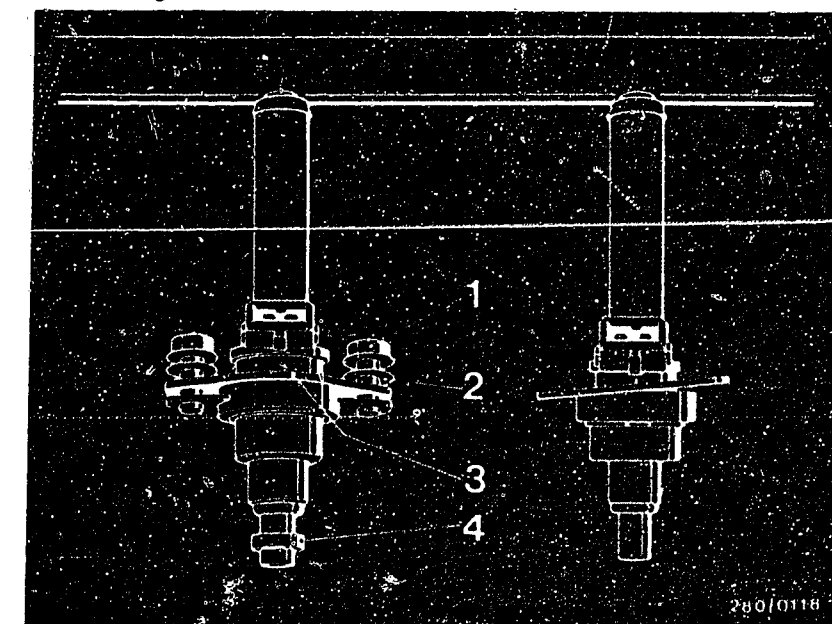
Ensure proper seating of both rubber seals on each injection valve. Replace defective seals. Press all 4 injection valves uniformly into their seats with the fuel delivery line.

Important: All injection valves must be installed leak-tight. Connect all air/vacuum hoses. Fasten the cup seals of the air-flow sensor. Screw on fastening clamp for fuel distribution pipe.

Hook in throttle cable.

Connect vacuum hose to brake booster and automatic transmission.

Re-check all fuel and air hose connections for security. Start engine and check whether any unmetered air is being drawn in.



- 1=Hexagon screw
- 2=Washer
- 3=Holder
- 4=Rubber ring

Testing completed for customer complaint

"Engine missing under all operating conditions".

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (See Coordinates B3...B8). If the fault has not been detected by "Direct trouble-shooting", see "Detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).

H1

Engine missing

Fiat Argenta 120 i.e.



H2

Engine missing

Fiat Argenta 120 i.e.



FUEL CONSUMPTION TOO HIGH

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

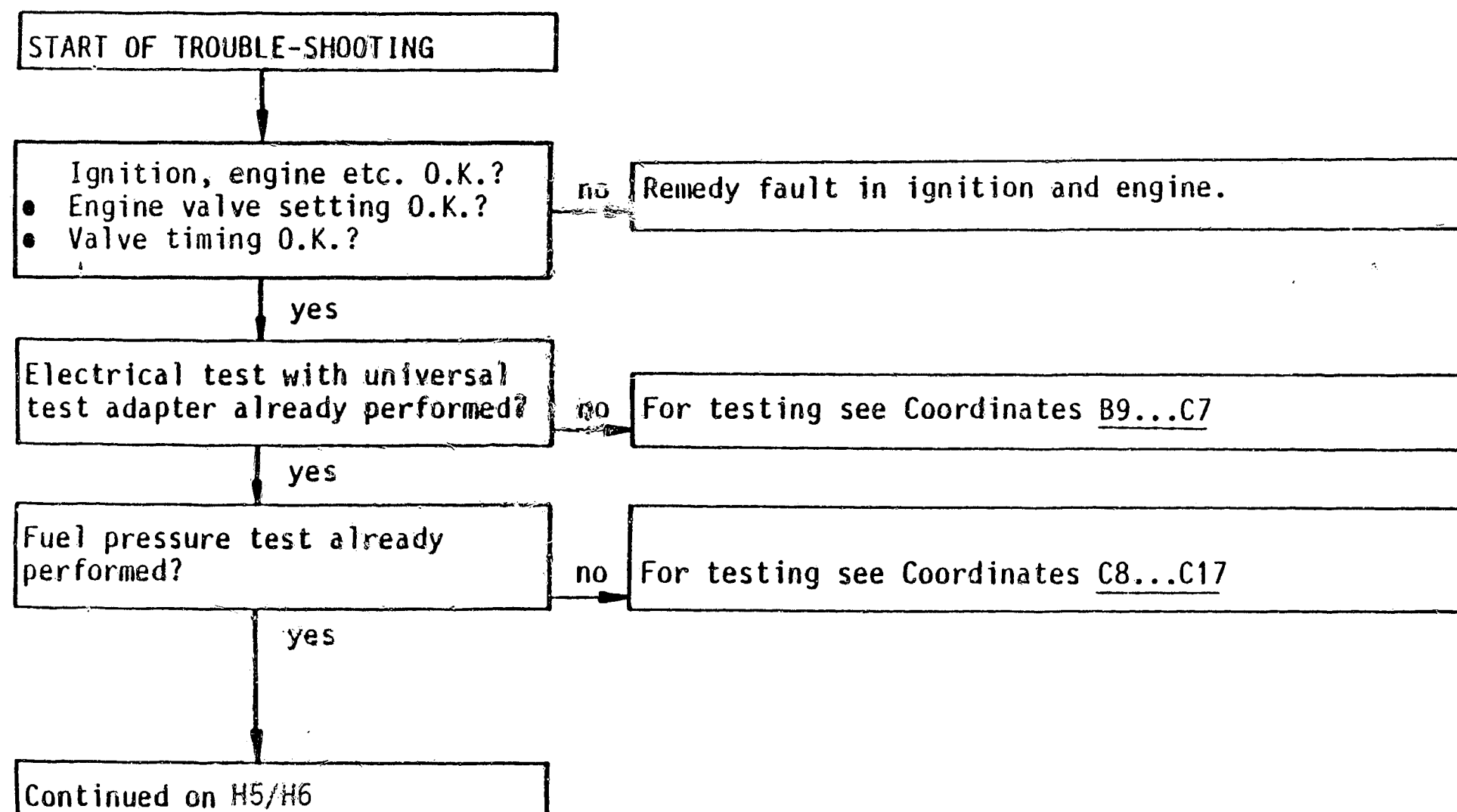
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

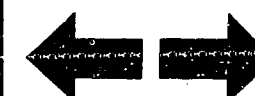
When you have finished testing continue trouble-shooting at the point at which you branched off.

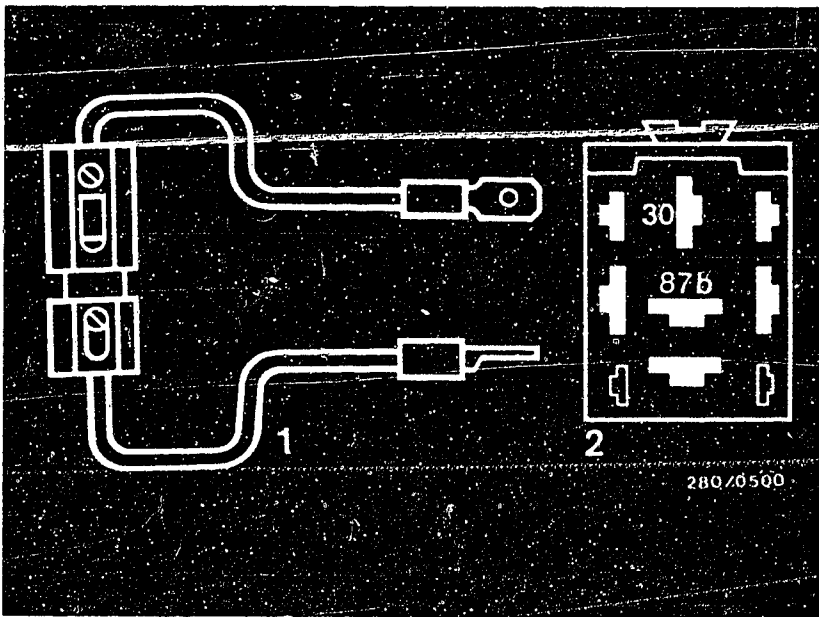
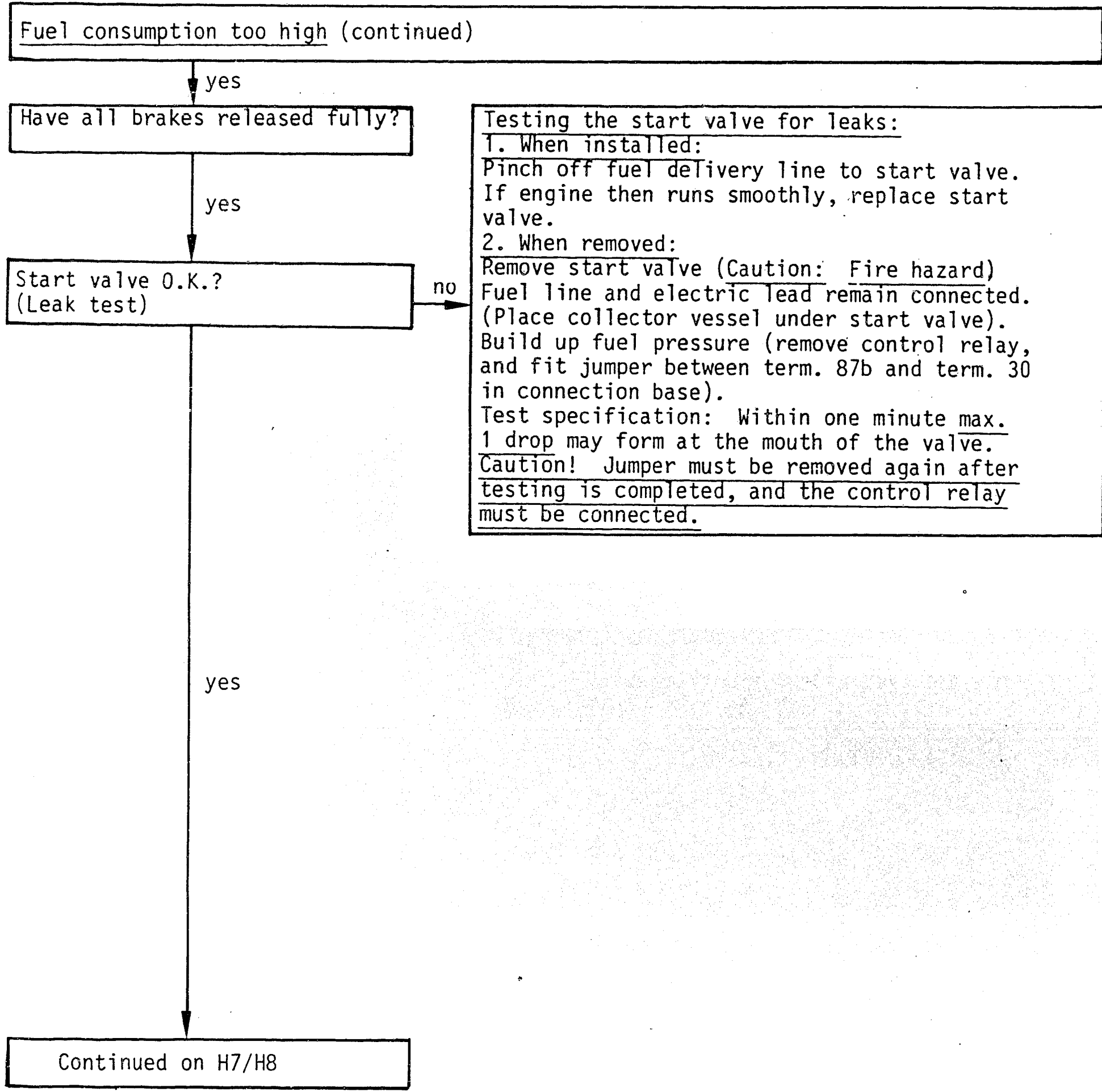
**H3**

Fuel consumption too high
Fiat Argenta 120 i.e.

**H4**

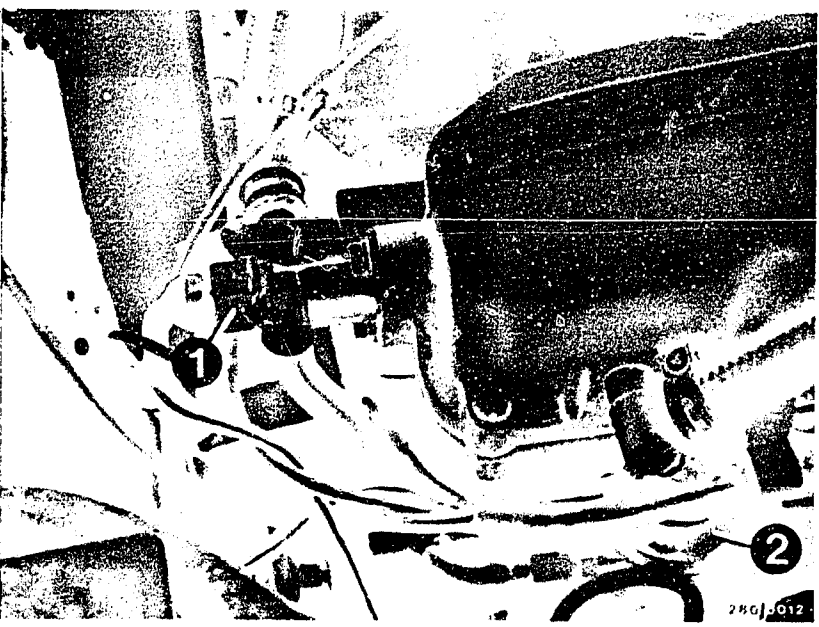
Fuel consumption too high
Fiat Argenta 120 i.e.





Jumper (user-fabricated)
1 = Fuse holder with 10 A fuse
2 = Top view of connection base

1 = Start valve (white plug)



Fuel consumption too high (continued)

yes

Injection valves mechanically O.K.?

- Does engine speed drop when injection-valve connectors are pulled off individually?
- Repair injection valves.

no

With the engine running, disconnect injection valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve is O.K. Test connecting leads from control relay term. 87 to the individual injection valves and from the injection valves to the control unit plug term. 12 for continuity with ohmmeter.

Set value:

approx. 0Ω

Resistance of individual injection valves: 15...20 Ω

Removing the injection valves

Unhook throttle cable. Loosen vacuum hose to ignition trigger box, to econometer, to brake booster and to automatic transmission (if applicable). Unscrew fastening clamp for fuel distribution pipe. Each injection valve is secured with a screw. Loosen this screw.

Loosen this screw.

Caution

Do not lose the washer. Pull all 4 injection valves out of the holes using the fuel distribution pipe.

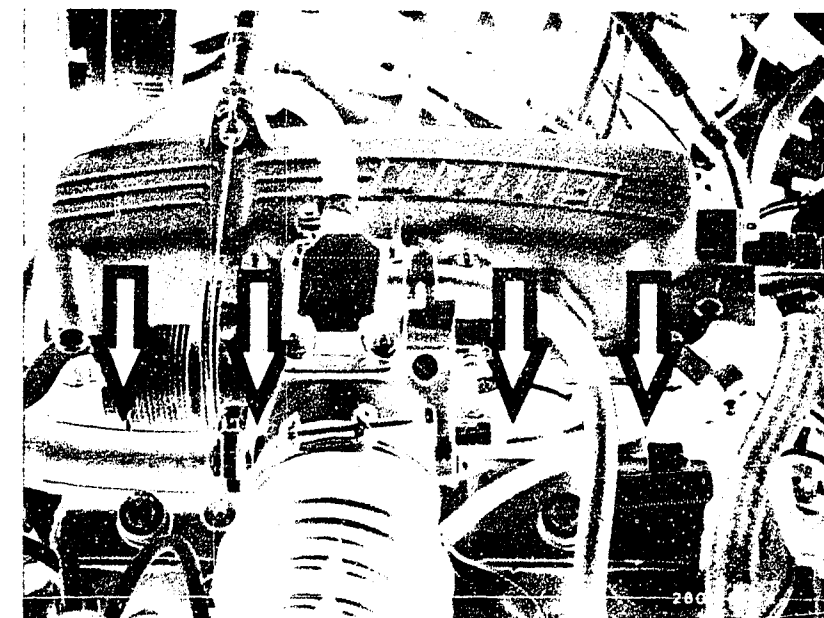
Warning

Pay attention to the rubber seals and the nozzle needles of the injection valves.

yes

Continued on H13/H14

Continued on H9/H10



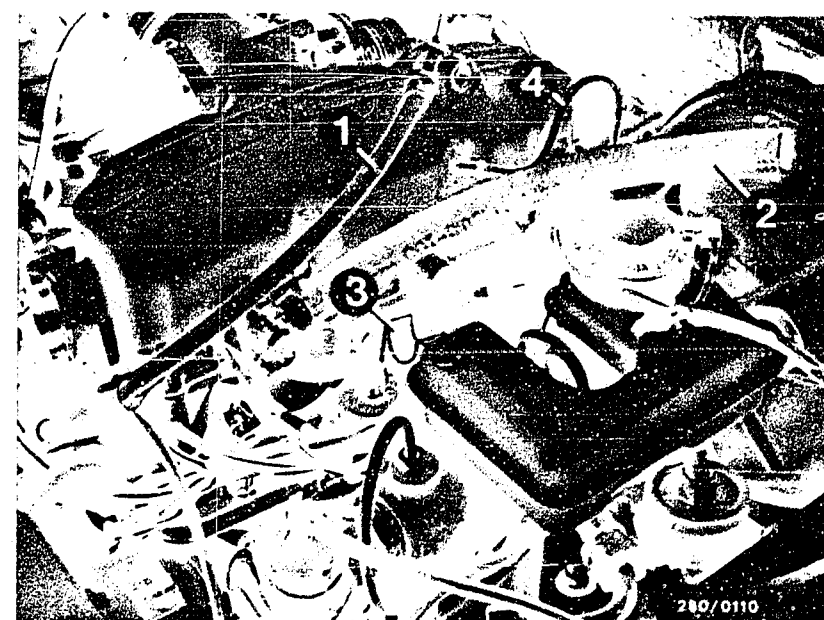
Arrow=Injection valves

1=Throttle cable

2=Vacuum hose

3=Fastening clamp

4=Vacuum hose to automatic transmission



H7

Fuel consumption too high
Fiat Argenta 120 i.e.



H8

Fuel consumption too high
Fiat Argenta 120 i.e.



Fuel consumption too high (continued)

yes

Replacing the injection valves

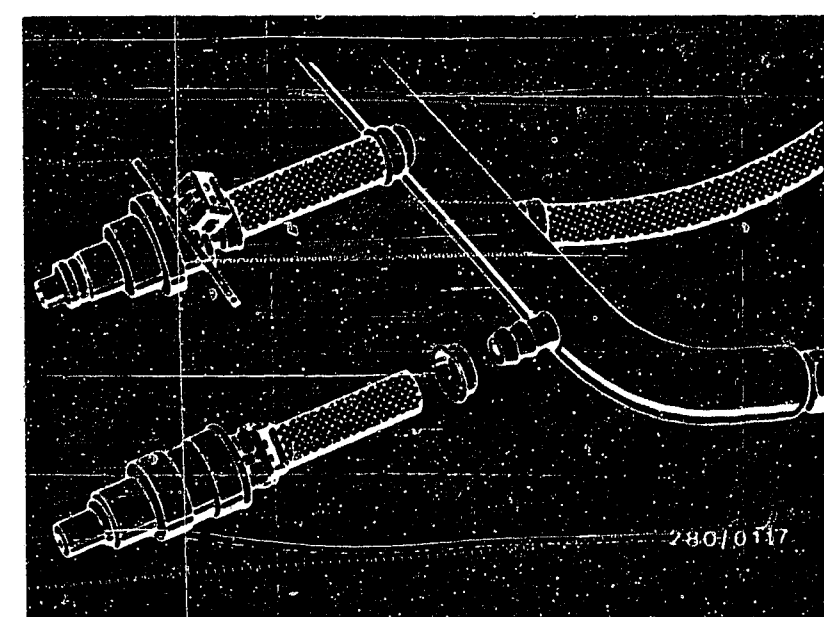
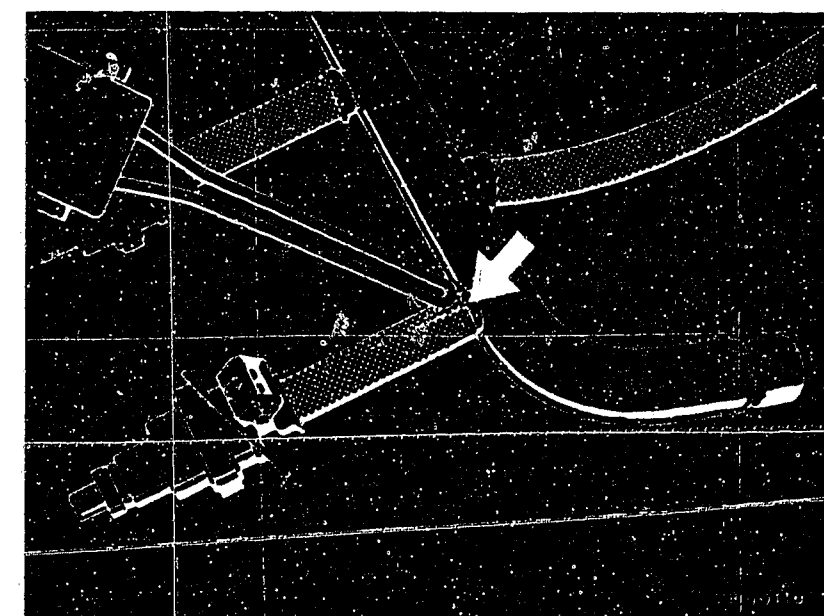
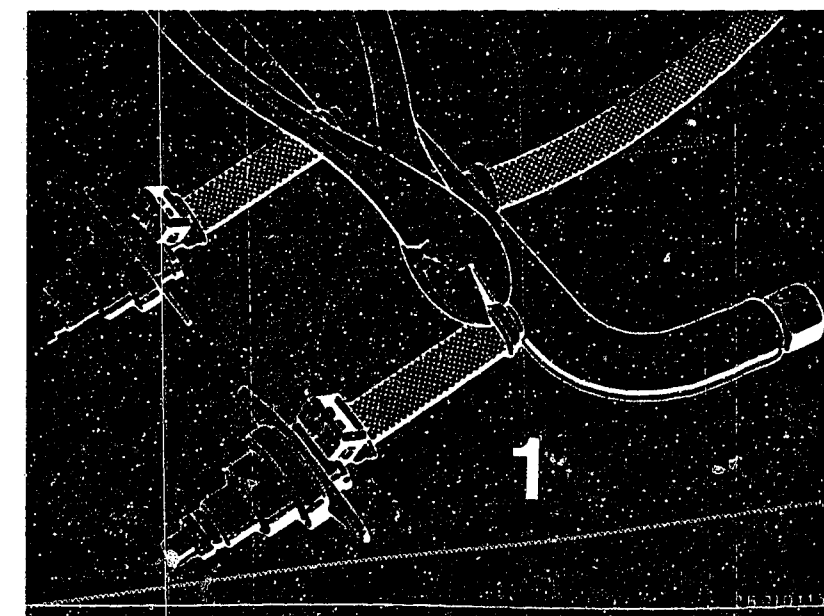
Break open the hose-termination sleeves (1) of the injection valves.

Cut open fuel hose longitudinally using soldering iron or soldering gun and pull off.

Mount new injection valve with hose-termination sleeve. To do this, wet inside of hose with fuel and push onto fitting as far as it will go. Note installation position of electrical connector.

Continued on H13/H14

Continued on H11/H12



H9

Fuel consumption too high
Fiat Argenta 120 i.e.



H10

Fuel consumption too high
Fiat Argenta 120 i.e.



Fuel consumption too high (continued)

yes

Installing the injection valves

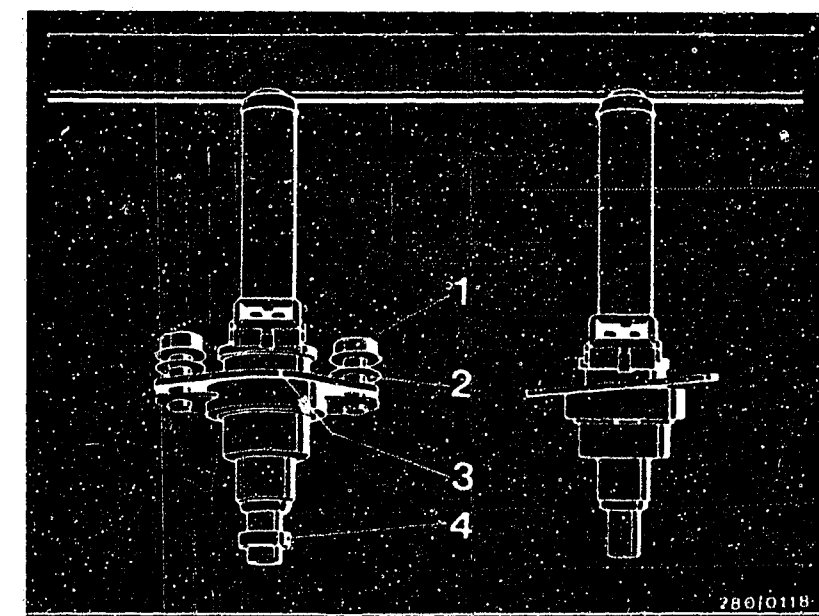
Ensure proper seating of both rubber seals on each injection valve. Replace defective seals. Press all 4 injection valves uniformly into their seats with the fuel delivery line.

Important: All injection valves must be installed leak-tight. Connect all air/vacuum hoses. Fasten the cup seals of the air-flow sensor. Screw on fastening clamp for fuel distribution pipe.

Hook in throttle cable.

Connect vacuum hose to brake booster and automatic transmission.

Re-check all fuel and air hose connections for security. Start engine and check whether any unmetered air is being drawn in.



- 1=Hexagon screw
- 2=Washer
- 3=Holder
- 4=Rubber ring

Continued on H13/H14

H11

Fuel consumption too high
Fiat Argenta 120 i.e.



H12

Fuel consumption too high
Fiat Argenta 120 i.e.



Fuel consumption too high (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

- Air-flow flap moves freely?
- Air-flow sensor flap return to rest position?
- Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5
(deflect air-flow sensor flap):

60...1000 Ω

no

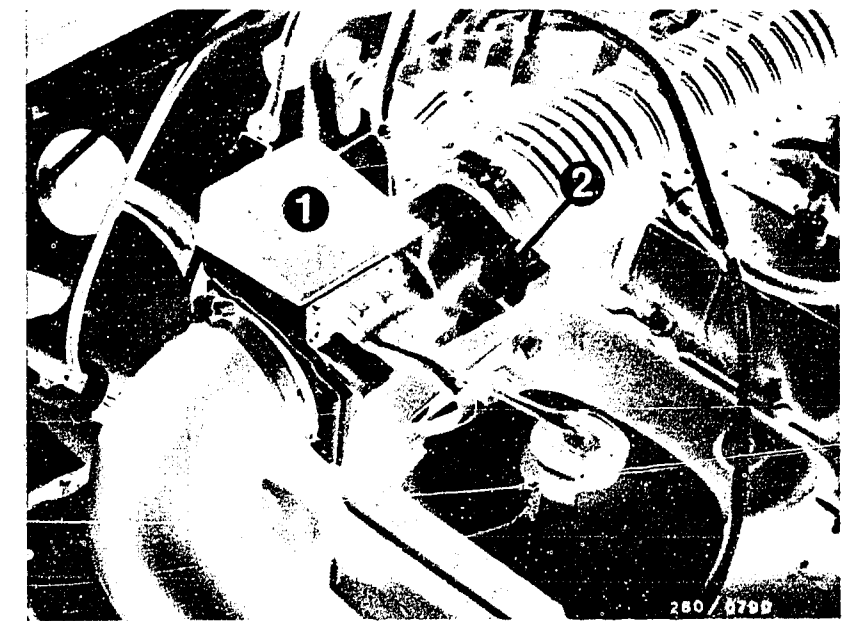
Testing:

- Unscrew air-flow sensor from air-filter housing. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. The sensor flap must close again fully by itself. Sensor flap must not catch when being opened. Watch for signs of abrasion and rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lintfree cloth. If there are signs of abrasion or rubbing, replace air-flow sensor.
- Air-flow sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. The air-flow sensor must be replaced.
- Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.
Test specification: 160...300 Ω
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.
Test specification: 60...1000 Ω

Caution: After testing is completed, the air-flow sensor must be screwed back onto the air-filter housing.

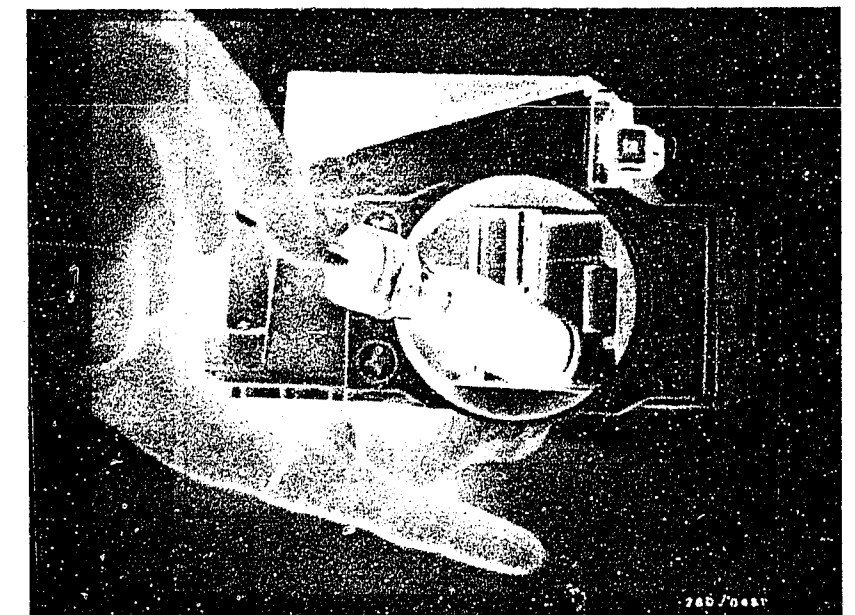
yes

Continued on H15/H16



1 = Air-flow sensor
2 = CO adjusting screw

Opening the air-flow sensor flap



H13

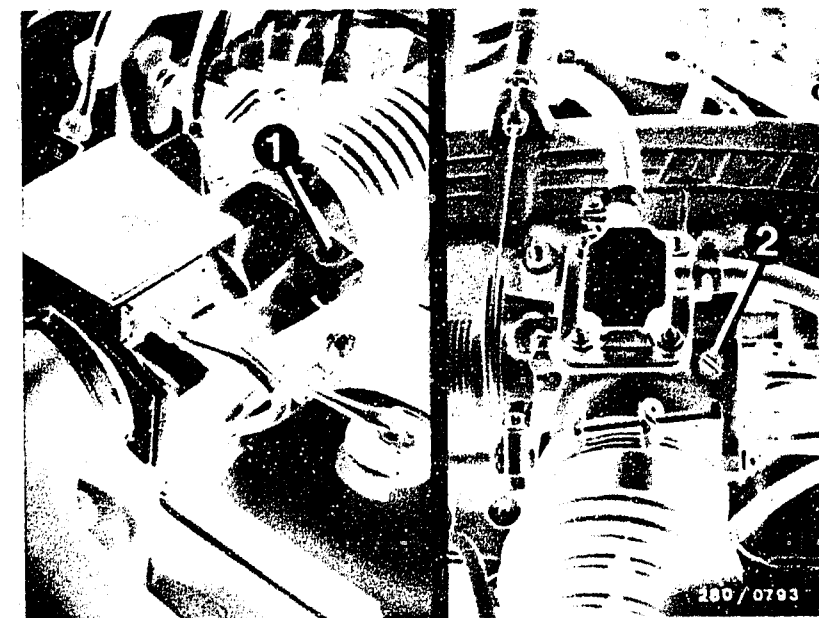
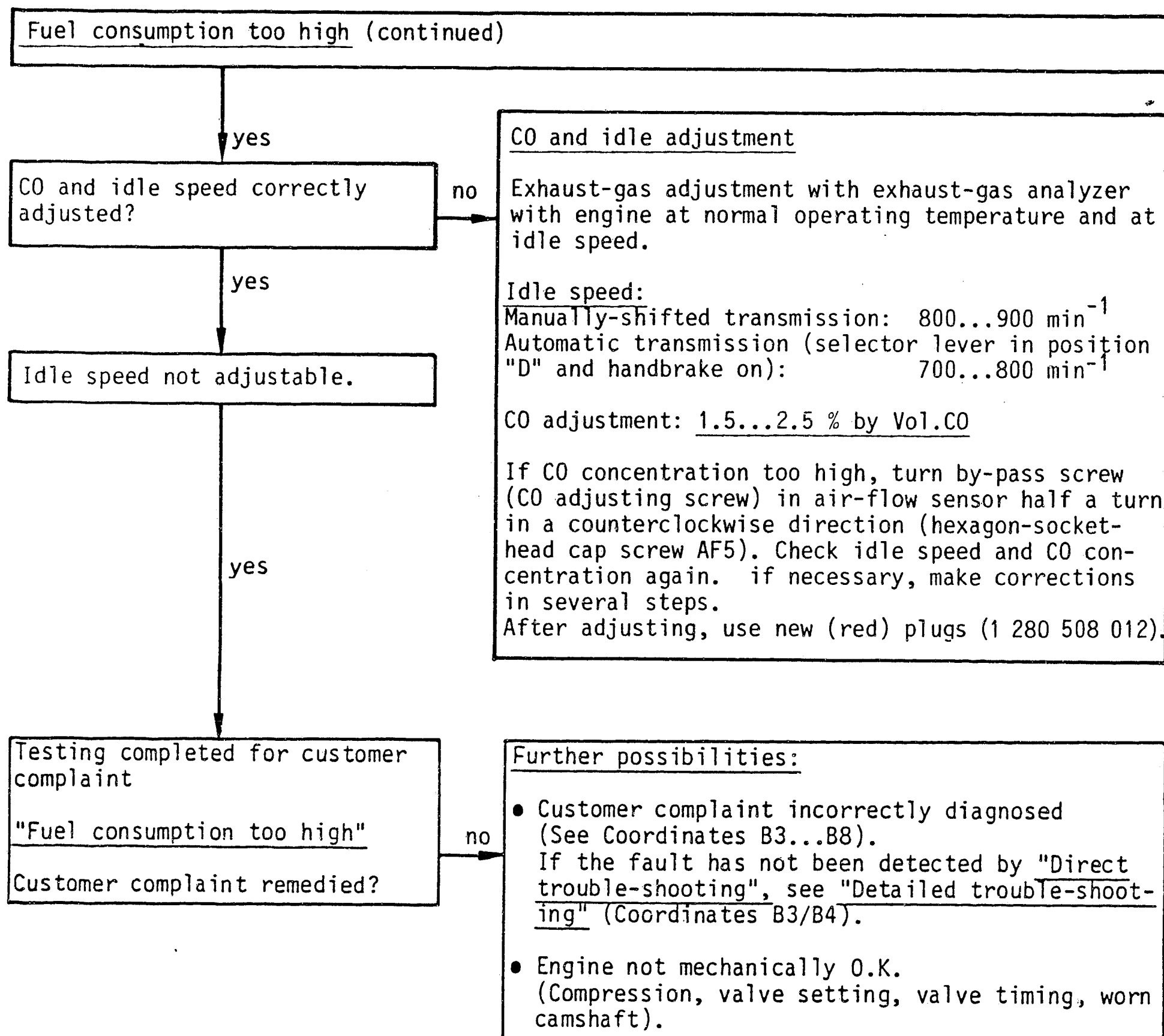
Fuel consumption too high
Fiat Argenta 120 i.e.



H14

Fuel consumption too high
Fiat Argenta 120 i.e.





1=CO adjusting screw
2=Idle adjusting screw



MAXIMUM ENGINE POWER / TOP SPEED NOT REACHED

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

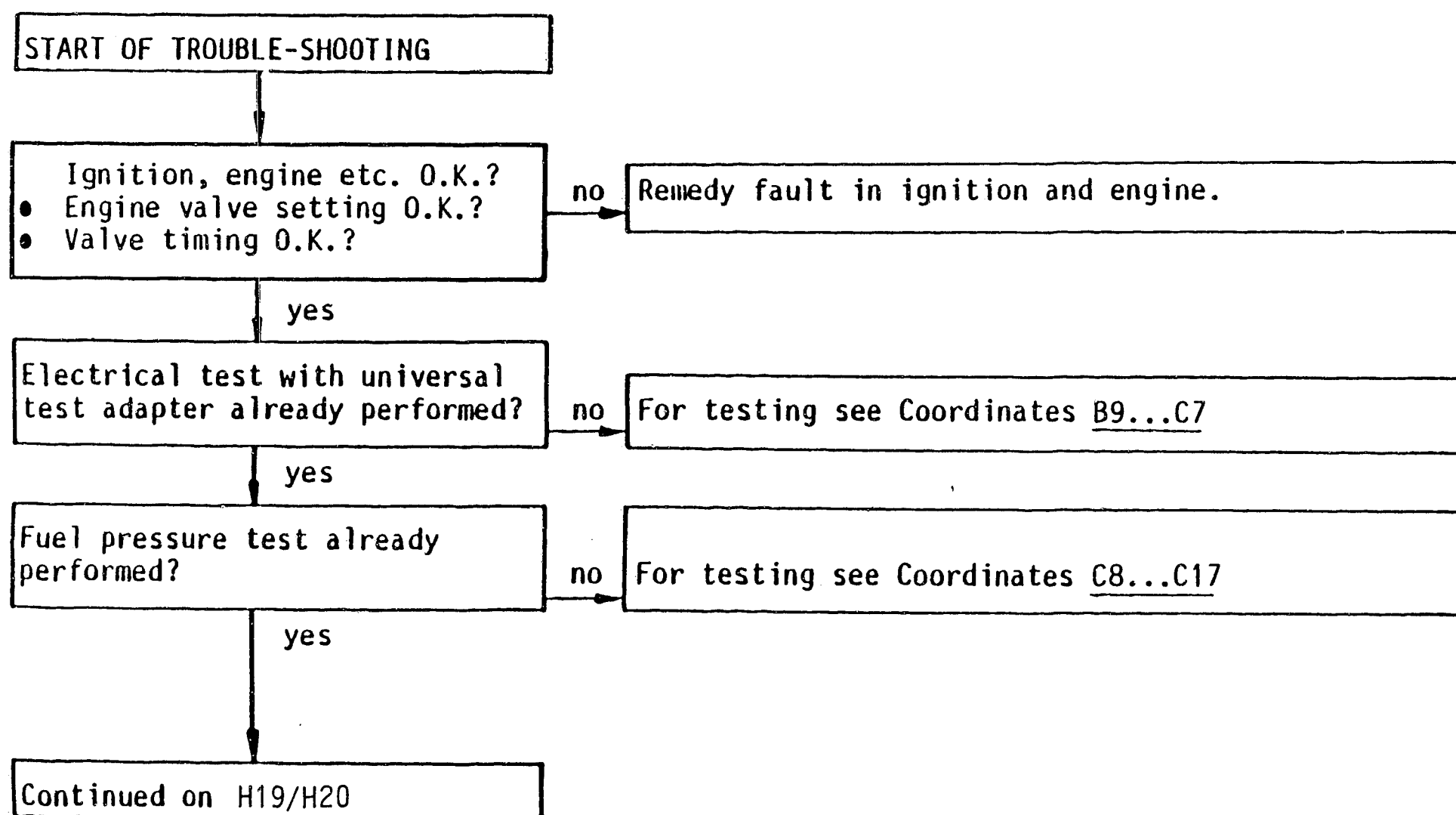
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.

**H17**

No maximum engine power
Fiat Argenta 120 i.e.

**H18**

No maximum engine power
Fiat Argenta 120 i.e.



Maximum engine power/top speed not reached (continued)

yes

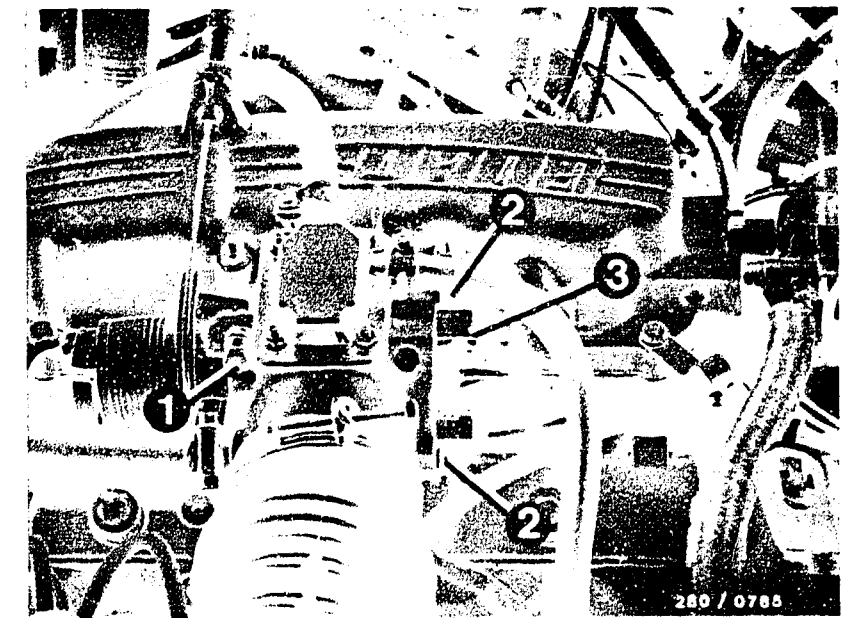
Throttle valve opening fully?

no

Throttle linkage, accelerator pedal O.K.? If necessary, straighten linkage. Throttle linkage may stick due to floor mat etc. Check plug-in connection on throttle valve switch. Using ohmmeter, test lead term. 3 from control unit plug to throttle-valve switch term. 3 and from throttle-valve switch lead 9 (term. 18) to control unit plug term. 9 for continuity (open throttle valve fully while doing this). Set value approx. 0Ω . If necessary, replace throttle-valve switch.

yes

Continued on H21/H22



3=Throttle-valve switch

H19

No maximum engine power
Fiat Argenta 120 i.e.



H20

No maximum engine power
Fiat Argenta 120 i.e.



Maximum engine power / top speed not reached (continued)

yes

Throttle-valve switch O.K.?
Control unit O.K.?
(Full-load enrichment)

no

Connect test lead as follows:

The two-pole plug-in connections of the test lead are connected between an injection valve and its connecting lead.

Of the other two terminals of the test lead, only one terminal must be connected to the special input of the motortester.

Caution:

The other terminal must not be brought into contact with vehicle ground.

If the correct terminal is connected, the oscilloscope pattern shown opposite is visible. With the aid of the test lead it is possible to test the injection pulses at the injection valves with an ignition oscilloscope with the engine running.

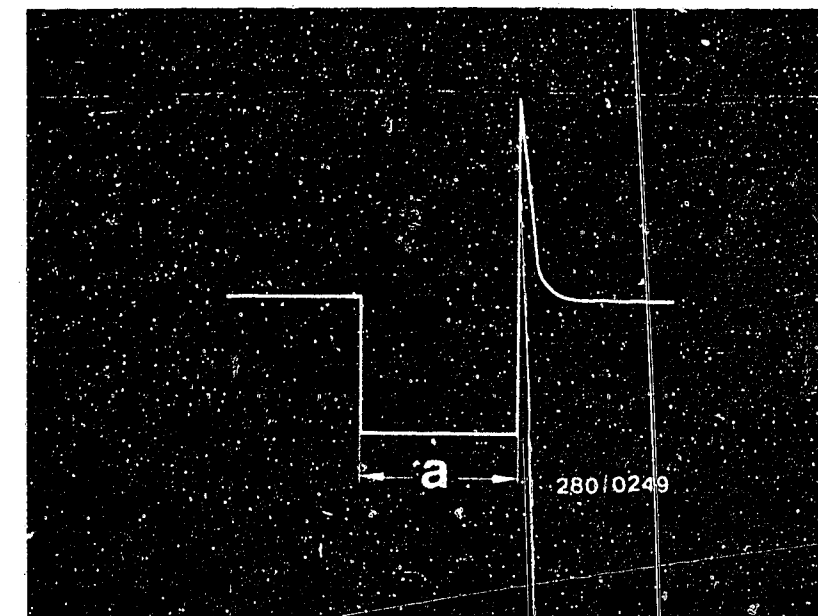
Observe injection pulses at idle. Disconnect throttle-valve switch connector and bridge term. 3 and term. 18 (lead 9) (using insulated jumper).

Caution

Do not bend any plug-in tabs. Injection pulse must become longer. If not: Test connecting leads from control unit plug to throttle-valve switch (term. 3 and term. 18) (lead 9) for continuity. If O.K., replace control unit.

yes

Continued on H23/H24



Injection pulse of a switched output stage (measured on the solenoid-operated injection valve)
a = Pulse length (dependent on the engine load)

H21

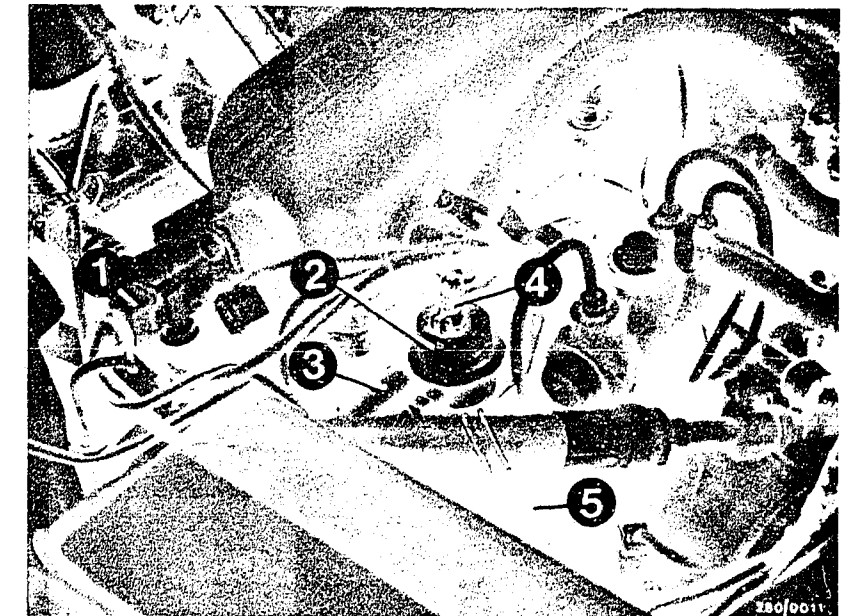
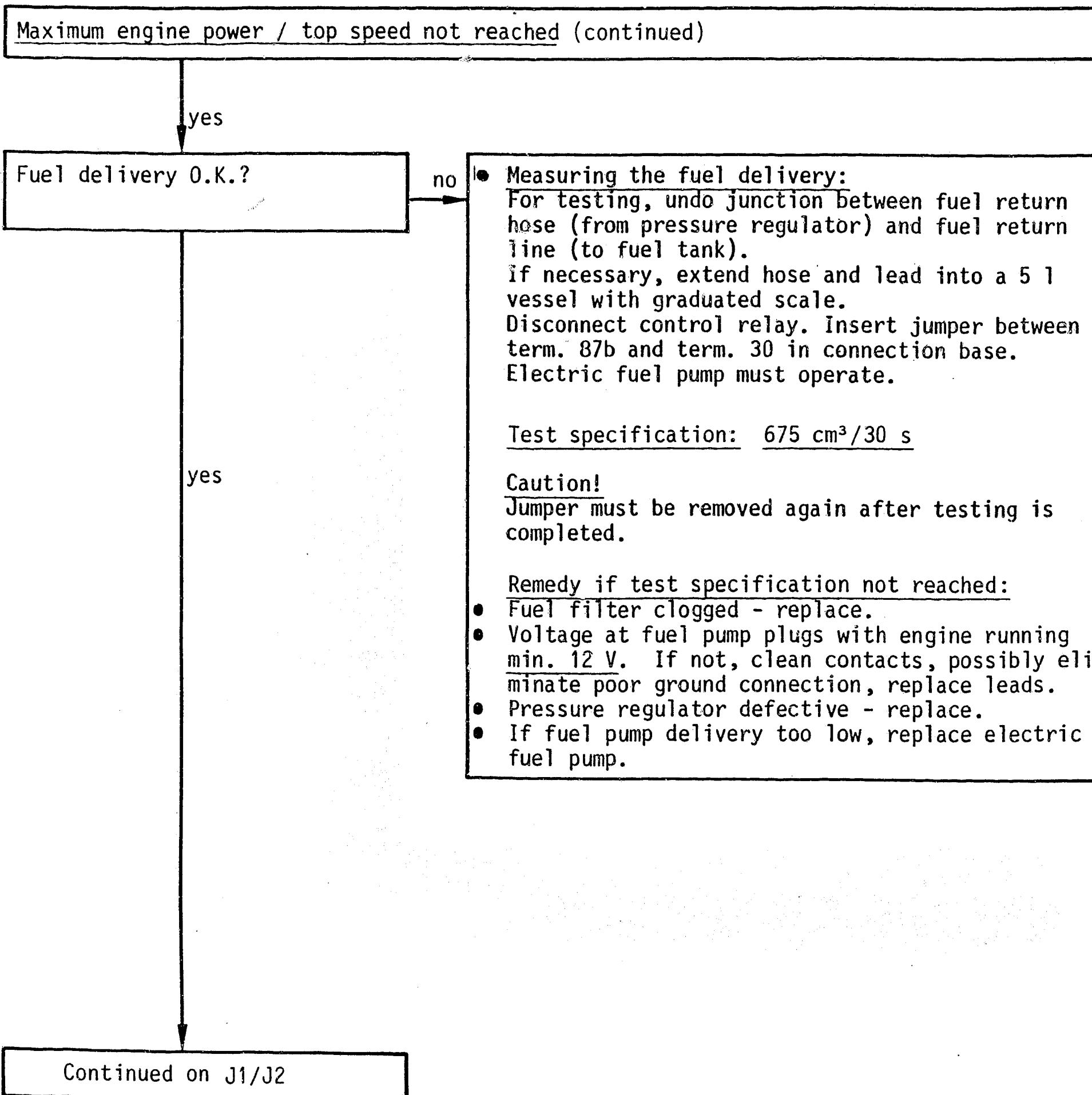
No maximum engine power
Fiat Argenta 120 i.e.



H22

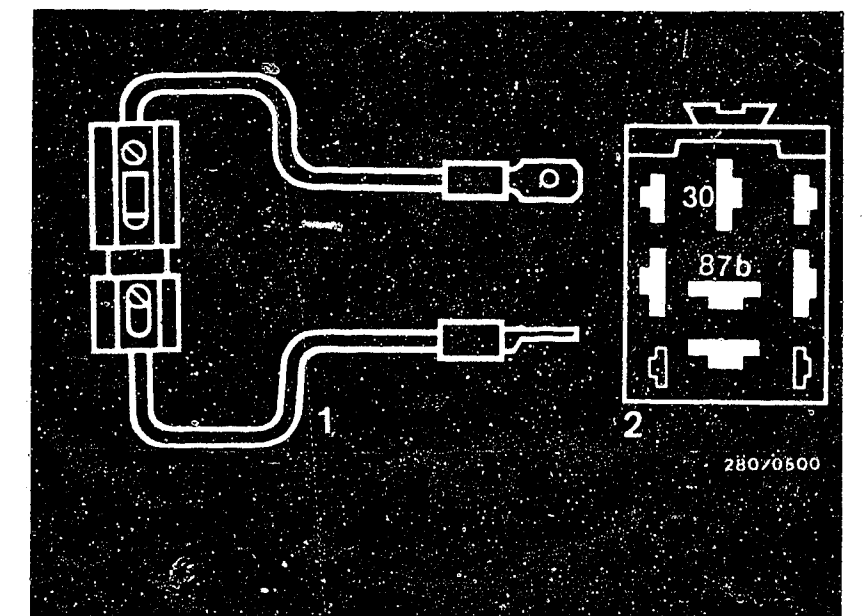
No maximum engine power
Fiat Argenta 120 i.e.





2 = Pressure regulator
5 = Fuel return line

Jumper (user-fabricated)
1 = Fuse holder with 10 A fuse
2 = Top view of connection base



H23

No maximum engine power
Fiat Argenta 120 i.e.



H24

No maximum engine power
Fiat Argenta 120 i.e.



Maximum engine power / top speed not reached (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

- Air-flow flap moves freely?
- Air-flow sensor flap return to rest position?
- Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5 (deflect air-flow sensor flap):

60...1000 Ω

no

Testing:

- Unscrew air-flow sensor from air-filter housing. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. The sensor flap must close again fully by itself. Sensor flap must not catch when being opened. Watch for signs of abrasion and rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lintfree cloth. If there are signs of abrasion or rubbing, replace air-flow sensor.

- Air-flow sensor flap must return to rest position. If not, the stopper or the sensor flap is bent.

The air-flow sensor must be replaced.

- Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.

Test specification: 160...300 Ω

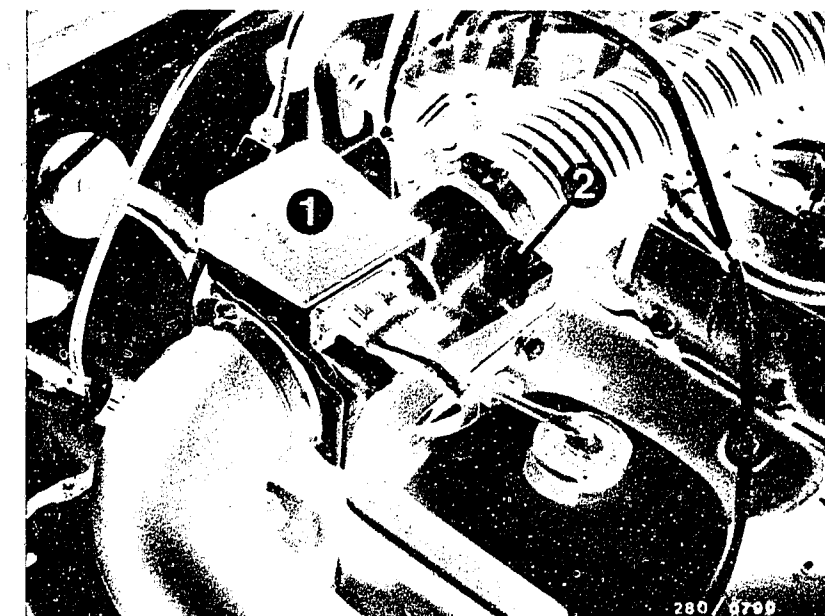
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.

Test specification: 60...1000 Ω

Caution: After testing is completed, the air-flow sensor must be screwed back onto the air-filter housing.

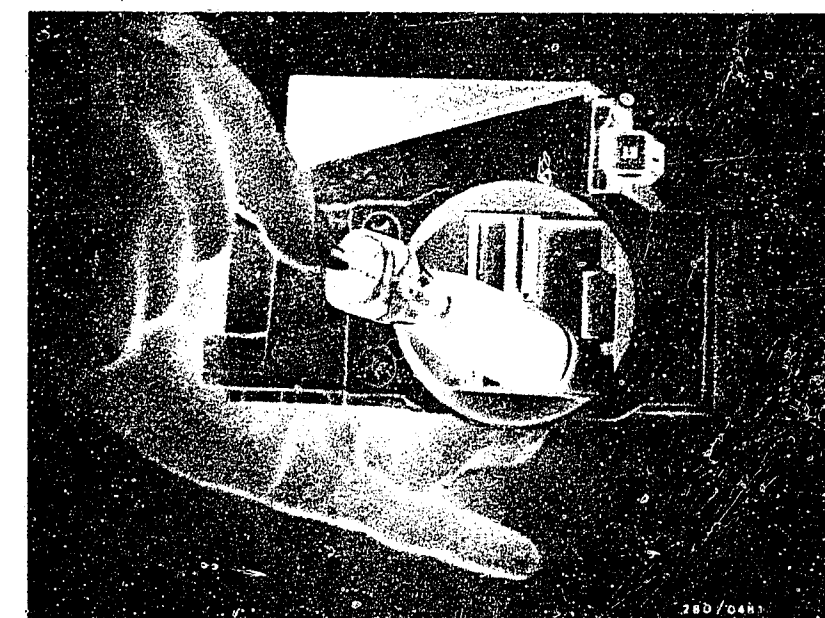
yes

Continued on J3/J4



1 = Air-flow sensor
2 = CO adjusting screw

Opening the air-flow sensor flap



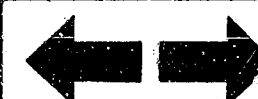
J1

No maximum engine power
Fiat Argenta 120 i.e.



J2

No maximum engine power
Fiat Argenta 120 i.e.



Maximum engine power / top speed not reached (continued)

yes

Are all hose lines and electrical lead connections properly attached?
Visual examination.
Is the air-intake system leak-tight?

no

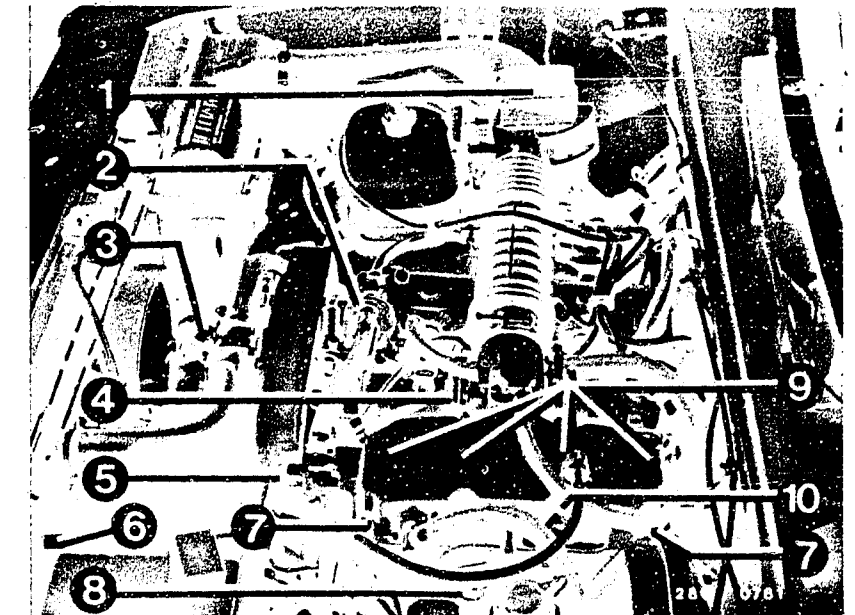
Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks by means of new seals or by retightening the connecting screws.

Leak test:

Seal off exhaust tail pipe. Unscrew hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and, using compressed-air gun, blow air (0.3 bar gauge pressure) into the intake manifold. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Leaks may also occur at the following points on the engine: Oil dipstick incorrectly inserted, defective oil filler neck lid seal etc. Bubbling or foaming indicates a leak.

yes

Continued on J5/J6



- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

J3

No maximum engine power
Fiat Argenta 120 i.e.



J4

No maximum engine power
Fiat Argenta 120 i.e.



Maximum engine power / top speed not reached (continued)

yes

Testing completed for customer complaint

"No maximum engine power"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically OK (compression, valve setting, valve timing, worn camshaft).

J5

No maximum engine power
Fiat Argenta 120 i.e.



J6

No maximum engine power
Fiat Argenta 120 i.e.



IDLE SPEED AND CO CONCENTRATION TOO LOW OR TOO HIGH

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

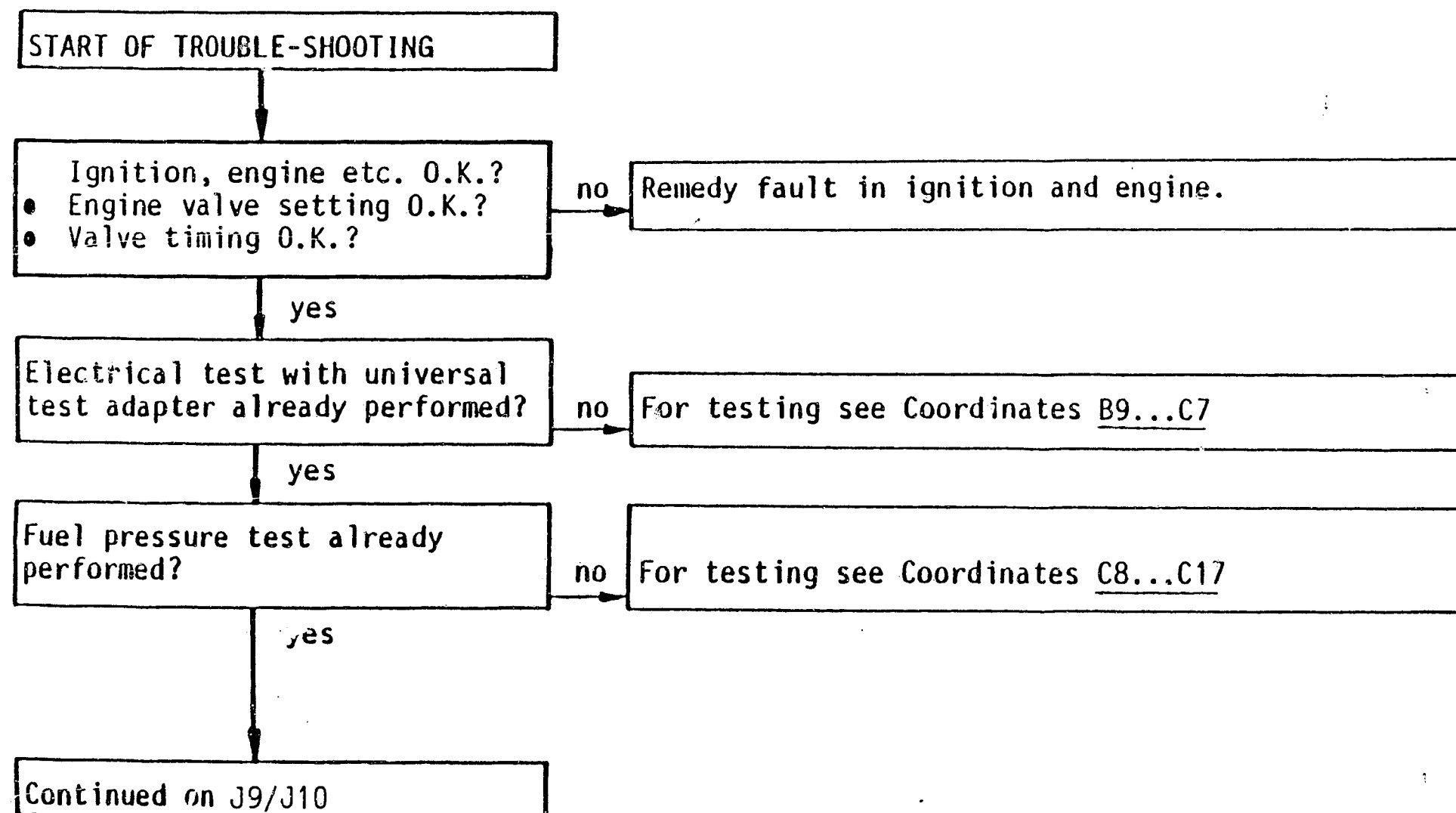
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



J7

Idle speed and CO concentration
Fiat Argenta 120 i.e.



J8

Idle speed and CO concentration
Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

CO and idle speed correctly adjusted?

no

CO and idle adjustment

Exhaust-gas adjustment with exhaust-gas analyzer with engine at normal operating temperature and at idle speed.

Idle speed:

Manually-shifted transmission: $800 \dots 900 \text{ min}^{-1}$
Automatic transmission (selector lever in position "D" and handbrake on): $700 \dots 800 \text{ min}^{-1}$

CO adjustment: $1.5 \dots 2.5 \%$ by Vol.CO

If CO concentration too high, turn by-pass screw (CO adjusting screw) in air-flow sensor half a turn in a counterclockwise direction (hexagon-socket-head cap screw AF5). Check idle speed and CO concentration again. if necessary, make corrections in several steps.

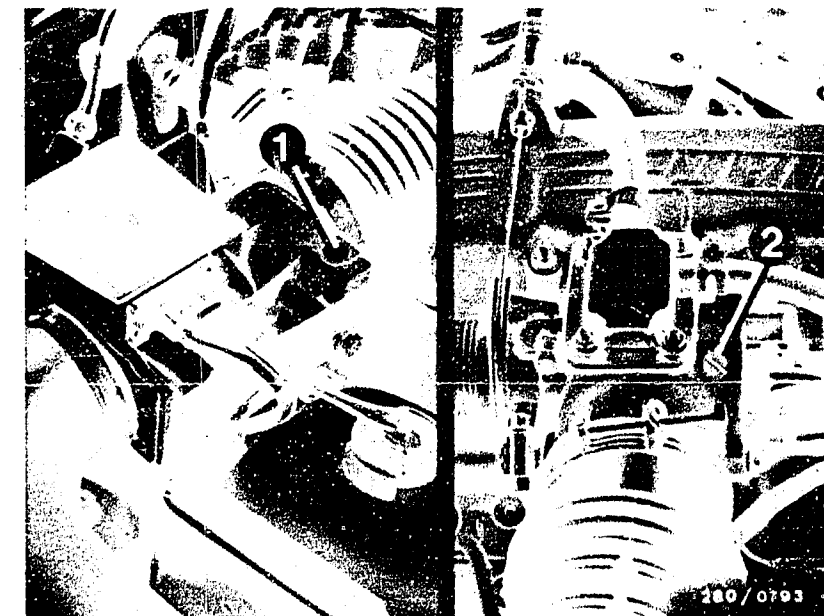
After adjusting, use new (red) plugs (1 280 508 012).

yes

Idle speed not adjustable.

yes

Continued on J11/J12



1=CO adjusting screw
2=Idle adjusting screw

J9

CO adjustment

Fiat Argenta 120 i.e.



J10

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

Air-flow sensor mechanically and electrically O.K.?

- Air-flow flap moves freely?
- Air-flow sensor flap return to rest position?
- Resistance values within tolerance?

Between term. 8 and term. 9:

160...300 Ω

Between term. 7 and term. 5 (deflect air-flow sensor flap):

60...1000 Ω

no

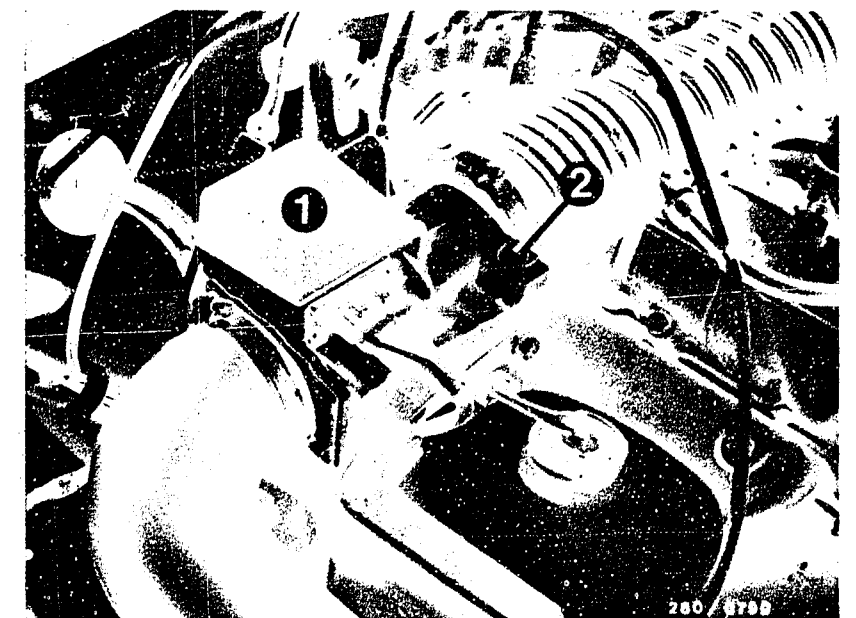
Testing:

- Unscrew air-flow sensor from air-filter housing. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. The sensor flap must close again fully by itself. Sensor flap must not catch when being opened. Watch for signs of abrasion and rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lintfree cloth. If there are signs of abrasion or rubbing, replace air-flow sensor.
- Air-flow sensor flap must return to rest position. If not, the stopper or the sensor flap is bent. The air-flow sensor must be replaced.
- Connect ohmmeter to term. 8 and term. 9 of air-flow sensor.
Test specification: 160...300 Ω
Connect ohmmeter to term. 7 and term. 5 of air-flow sensor. Fully deflect air-flow sensor flap.
Test specification: 60...1000 Ω

Caution: After testing is completed, the air-flow sensor must be screwed back onto the air-filter housing.

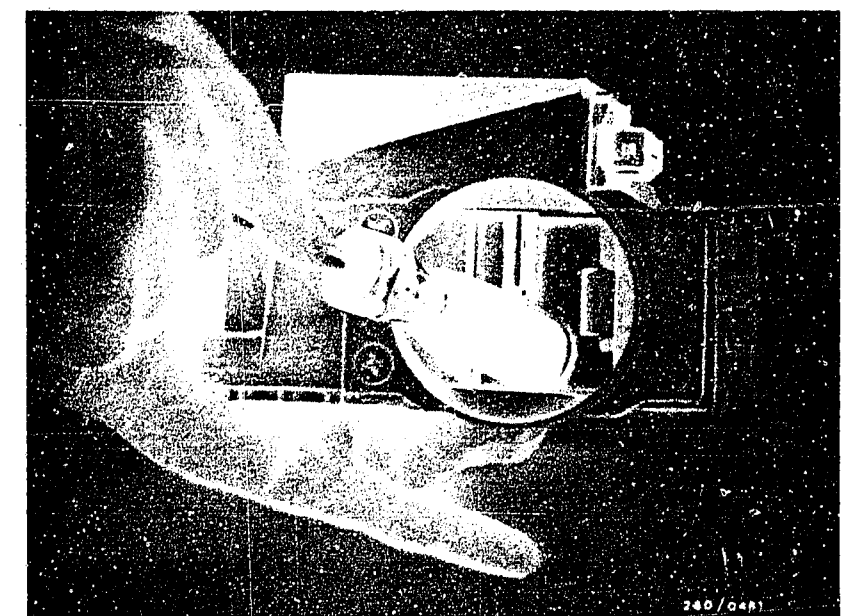
yes

Continued on J13/J14



1 = Air-flow sensor
2 = CO adjusting screw

Opening the air-flow sensor flap



J11

CO adjustment

Fiat Argenta 120 i.e.



J12

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

Auxiliary-air device mechanically O.K.?

Free cross section:

- cold - open?
- warm - closed?
- drop in engine speed if hose is pinched off? (cold engine).

no

Testing:

- Visual examination of auxiliary-air device
Disconnect hoses and look down (possibly using a small mirror). When cold, the cross-section must be partially open; when the engine is warm it must be closed. If not, replace auxiliary-air device.
- Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop noticeably. If not, replace auxiliary-air device (pay attention to direction of flow).

yes

Electrical operation of auxiliary-air device (power supply, ground lead, resistance) O.K.?

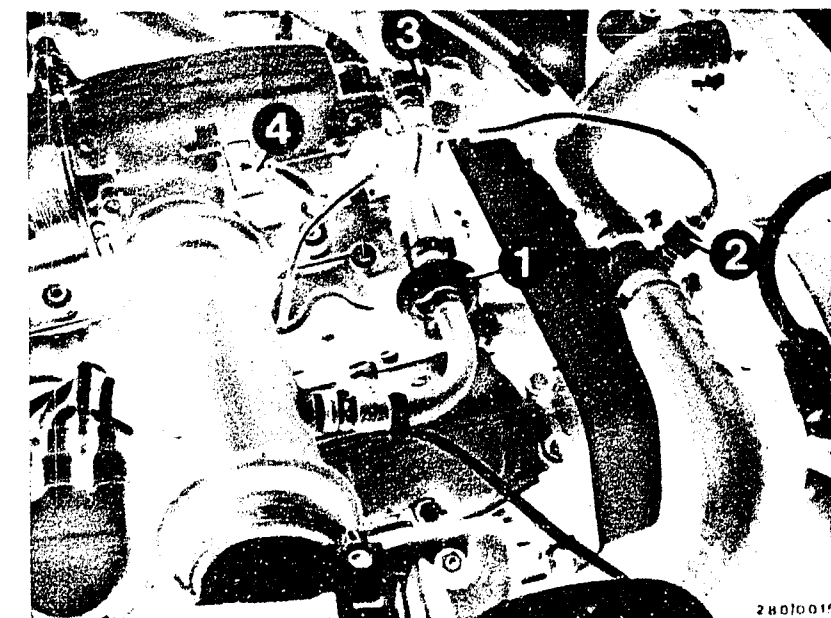
no

Start engine.

- Voltage at plug min. 12 V. If not, test the following leads for continuity (set value approx. 0 Ω):
 - From term. 26 to output stage ground terminal.
 - From term. 9/2 to control-unit plug term. 9.
- Resistance of auxiliary-air device 35...70 Ω (plug disconnected).
If resistance outside tolerance, replace auxiliary-air device.

yes

Continued on J15/J16



1=Auxiliary-air device
2=Temperature sensor II (engine)

2=Output stage ground terminal



J13

CO adjustment

Fiat Argenta 120 i.e.



J14

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

CO measured value below tolerance?

max. 2.5 % by Vol.CO

Start valve leaking?

no

Testing the start valve for leaks:

1. When installed:

Pinch off fuel delivery line to start valve.
If engine then runs smoothly, replace start valve.

2. When removed:

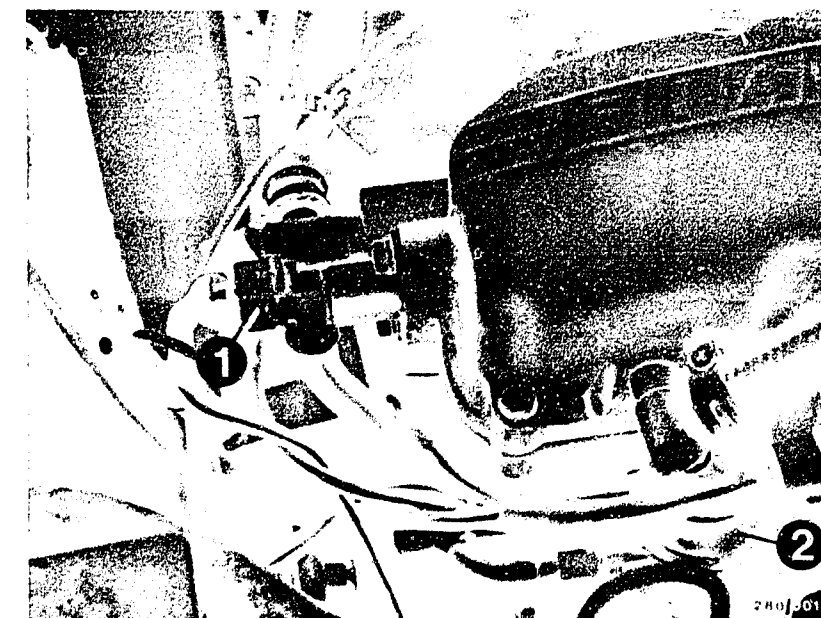
Remove start valve (Caution: Fire hazard)
Fuel line and electric lead remain connected.
(Place collector vessel under start valve).
Build up fuel pressure (remove control relay,
and fit jumper between term. 87b and term. 30
in connection base).

Test specification: Within one minute max.
1 drop may form at the mouth of the valve.

Caution! Jumper must be removed again after
testing is completed, and the control relay
must be connected.

yes

Continued on J17/J18

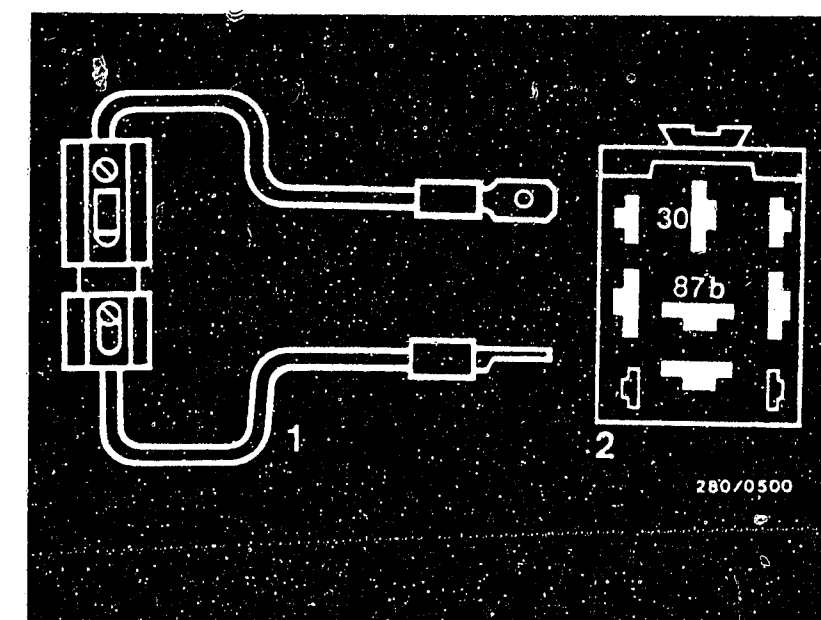


1 = Start valve (white plug)

Jumper (user-fabricated)

1 = Fuse holder with 10 A fuse

2 = Top view of connection base



J15

CO adjustment

Fiat Argenta 120 i.e.



J16

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

Injection valves mechanically O.K.?

- Does engine speed drop when injection-valve connectors are pulled off individually?
- Repair injection valves.

no

With the engine running, disconnect injection valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve is O.K. Test connecting leads from control relay term. 87 to the individual injection valves and from the injection valves to the control unit plug term. 12 for continuity with ohmmeter.

Set value:

approx. 0Ω

Resistance of individual injection valves: $15...20\Omega$

Removing the injection valves

Unhook throttle cable. Loosen vacuum hose to ignition trigger box, to econometer, to brake booster and to automatic transmission (if applicable). Unscrew fastening clamp for fuel distribution pipe. Each injection valve is secured with a screw. Loosen this screw.

Caution

Do not lose the washer. Pull all 4 injection valves out of the holes using the fuel distribution pipe.

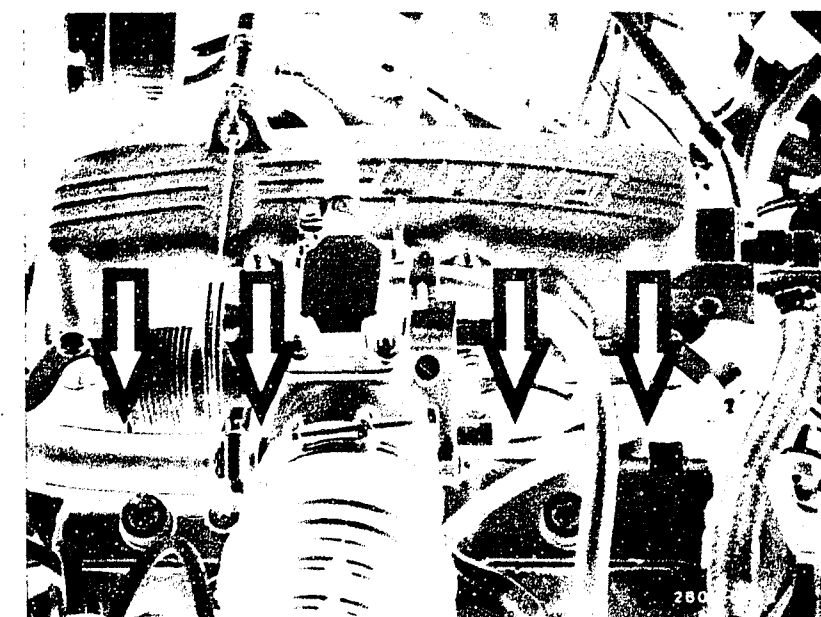
Warning

Pay attention to the rubber seals and the nozzle needles of the injection valves.

yes

Continued on J23/J24

Continued on J19/J20



Arrow=Injection valves

1=Throttle cable

2=Vacuum hose

3=Fastening clamp

4=Vacuum hose to automatic transmission



J17

CO adjustment

Fiat Argenta 120 i.e.



J18

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

Replacing the injection valves

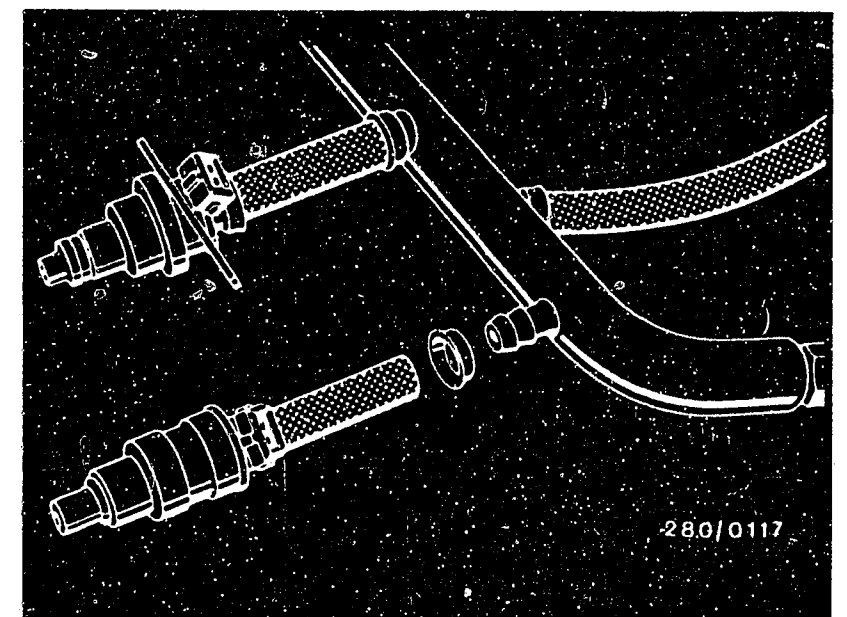
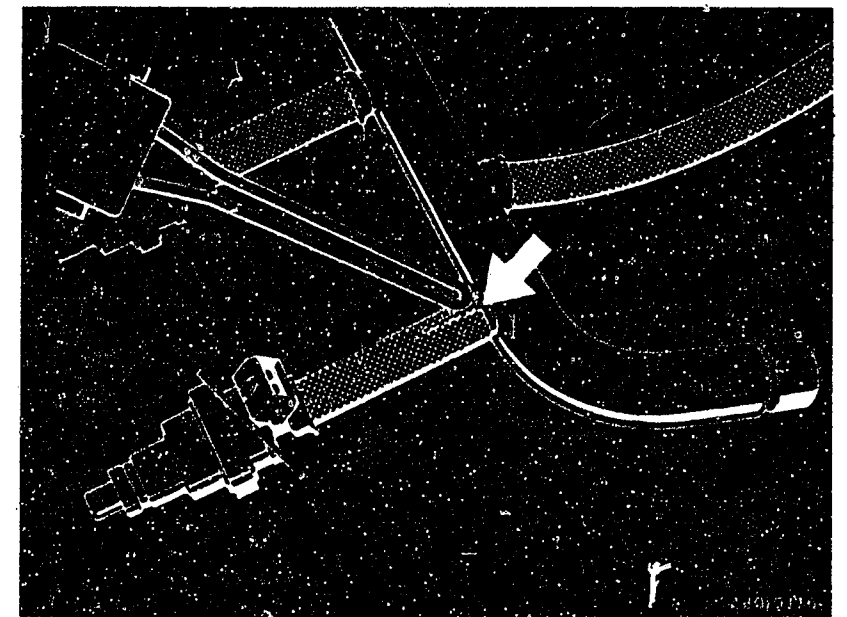
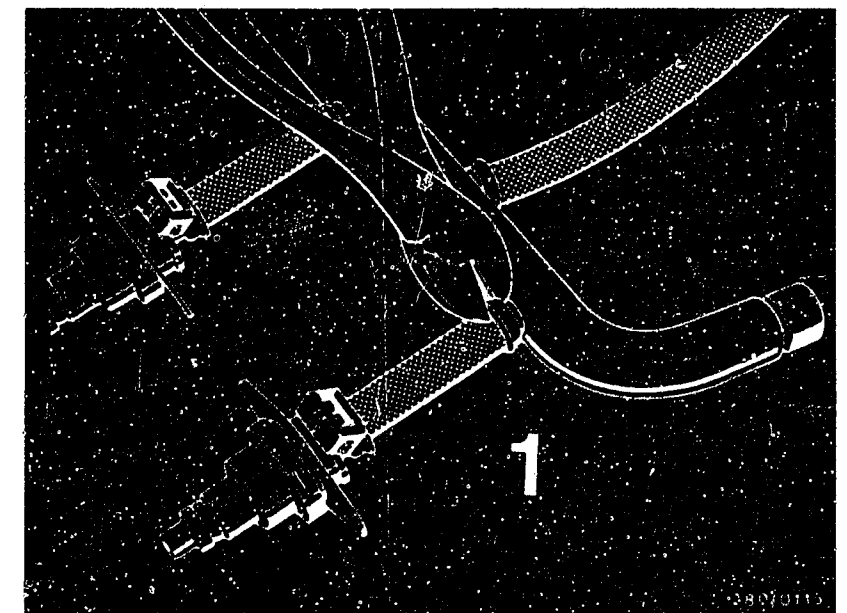
Break open the hose-termination sleeves (1) of the injection valves.

Cut open fuel hose longitudinally using soldering iron or soldering gun and pull off.

Mount new injection valve with hose-termination sleeve. To do this, wet inside of hose with fuel and push onto fitting as far as it will go. Note installation position of electrical connector.

Continued on J23/J24

Continued on J21/J22



J19

CO adjustment

Fiat Argenta 120 i.e.



J20

CO adjustment

Fiat Argenta 120 i.e.



Idle speed and CO concentration too low or too high (continued)

yes

Installing the injection valves

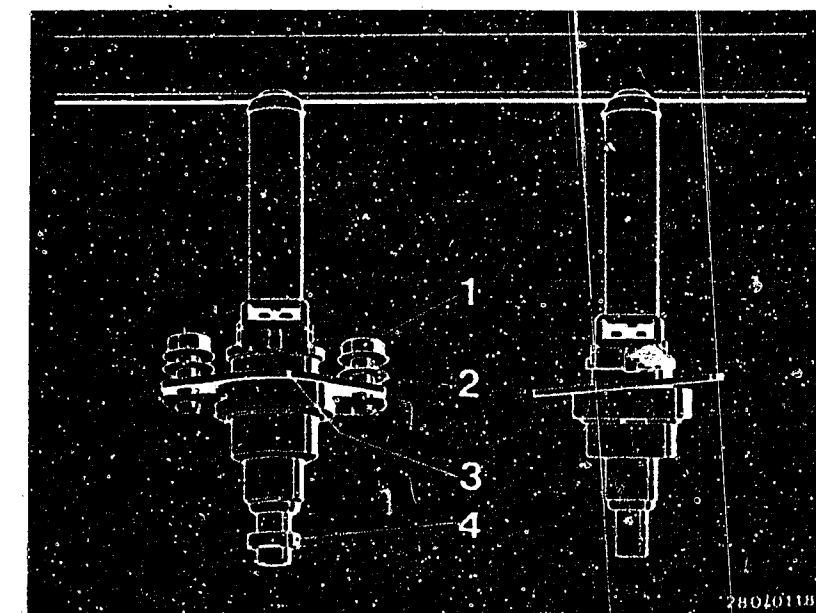
Ensure proper seating of both rubber seals on each injection valve. Replace defective seals. Press all 4 injection valves uniformly into their seats with the fuel delivery line.

Important: All injection valves must be installed leak-tight. Connect all air/vacuum hoses. Fasten the cup seals of the air-flow sensor. Screw on fastening clamp for fuel distribution pipe.

Hook in throttle cable.

Connect vacuum hose to brake booster and automatic transmission.

Re-check all fuel and air hose connections for security. Start engine and check whether any unmetered air is being drawn in.



- 1=Hexagon screw
- 2=Washer
- 3=Holder
- 4=Rubber ring

Continued on J23/J24

J21

CO adjustment

Fiat Argenta 120 i.e.

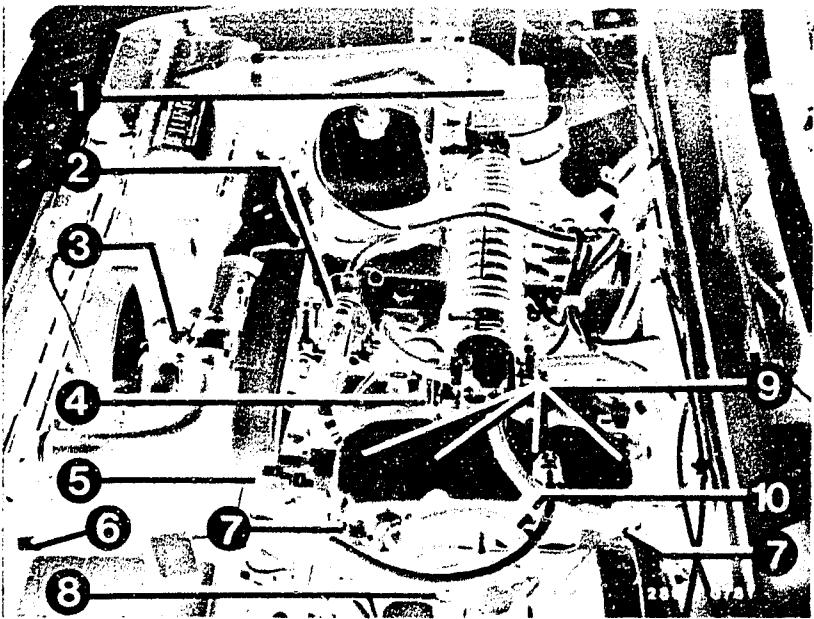
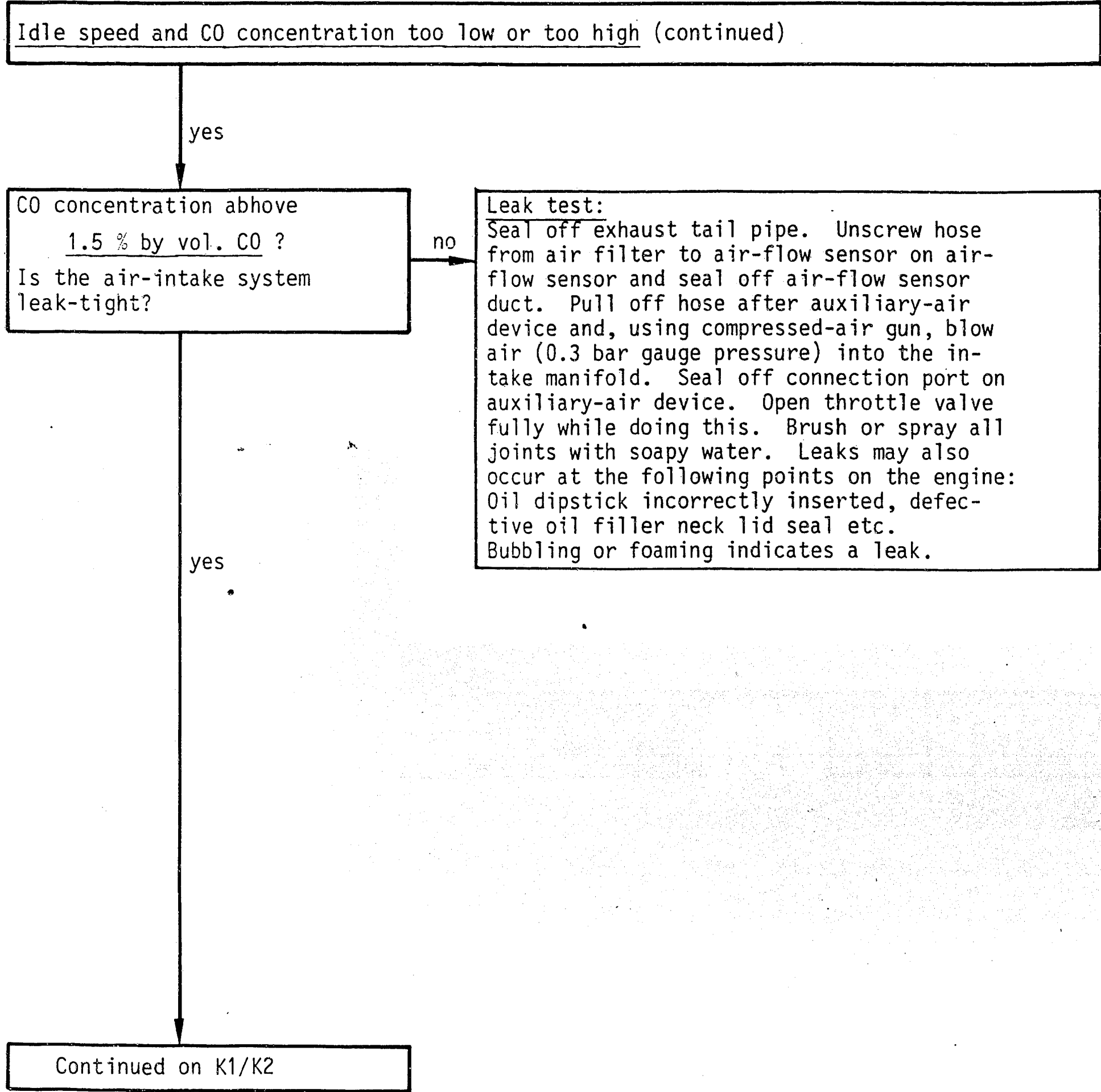


J22

CO adjustment

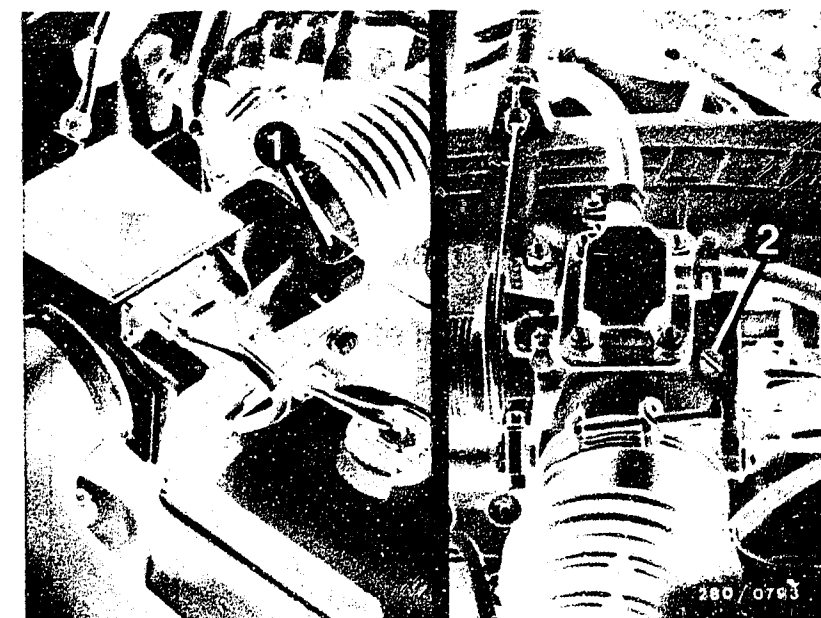
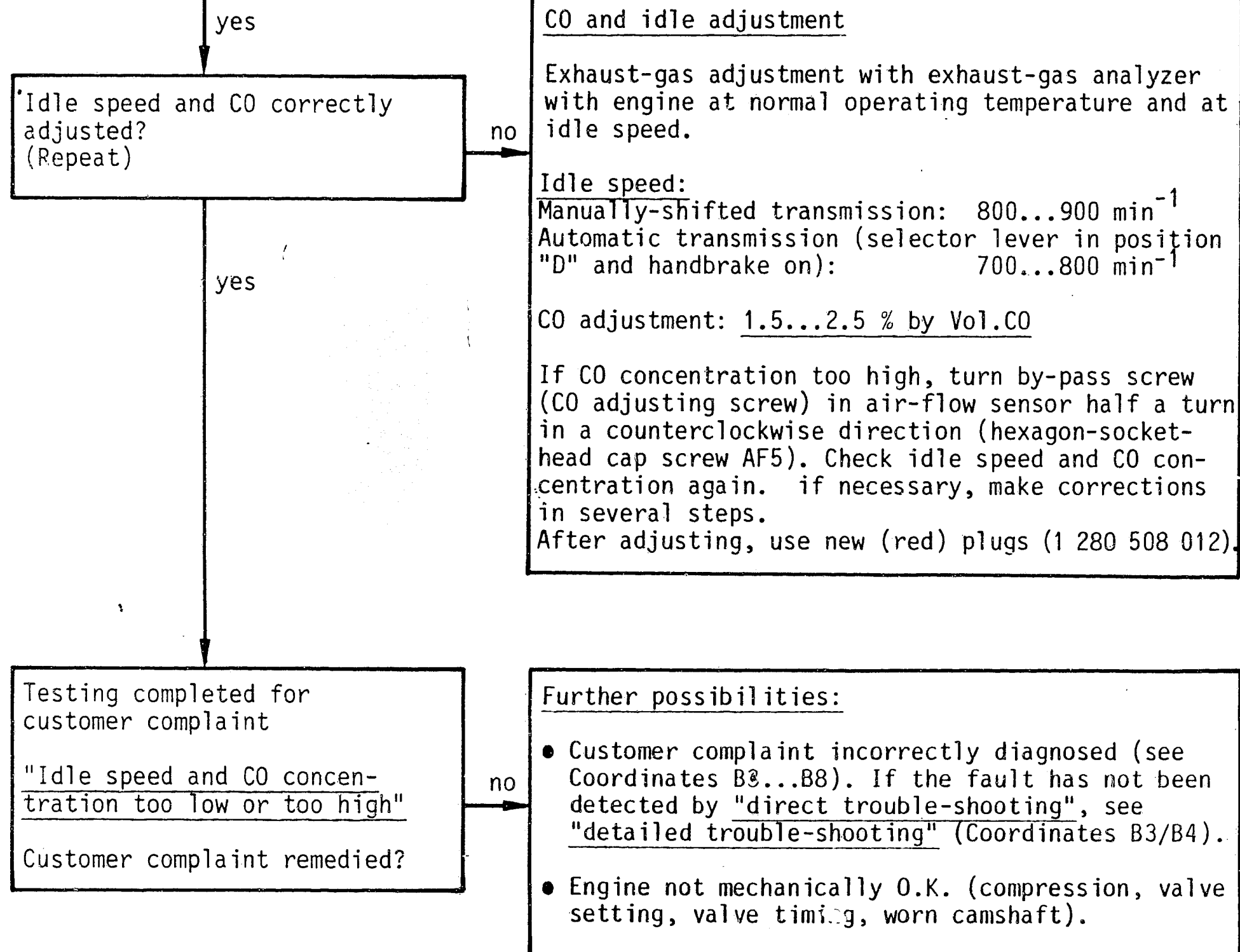
Fiat Argenta 120 i.e.





- 1=Air-flow sensor
- 2=Auxiliary-air device
- 3=NTC II
- 4=Throttle valve switch
- 5=Start valve
- 6=Control relay
- 7=Ground terminal
- 8=Pressure regulator
- 9=Injection valves
- 10=Thermo-time switch

Idle speed and CO concentration too low or too high (continued)



1 = Idle-speed adjusting screw
2 = CO adjusting screw

K1

CO adjustment

Fiat Argenta 120 i.e.



K2

CO adjustment

Fiat Argenta 120 i.e.



After-sales Service

Technical Bulletin

not to be used without the Bosch organization's authorization and not to be communicated to any third party.

DETERMINATION OF THE TEMPERATURE VALUES
GIVEN IN L-JETRONIC MANUALS

VDT-I-280/108 En
5.1982

We have recently been asked with increasing regularity how accurately the engine temperature must be measured when trouble-shooting on the vehicle.

So far in its L-Jetronic manuals KH/VSK has given three or four different temperatures for testing the temperature sensor:

-10 °C, +20 °C, +40 °C and +80 °C,

and two ranges for the thermo-time switch e.g. 35 °C 8 sec.

below +30 °C and above +40 °C.

Since the temperature range need not be subject to such close tolerances, we propose in future the following more appropriate definition:

- Ambient temperature (approx. +15 °C to +30 °C)
- Engine at normal operating temperature (approx. +80 °C).

Please direct questions and comments concerning the contents to our authorized representative in your country.

BOSCH

Geschäftsbereich KM, Kundendienst, Kfz-Ausrüstung
Dr. Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

N1

Technical Bulletins

Fiat Argenta 120 i.e.



After-sales Service

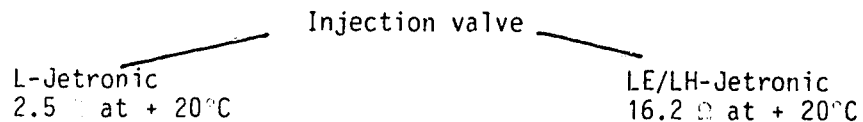
Technical Bulletin

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CODING OF LE/LH-JETRONIC
SOLENOID-OPERATED INJECTION VALVES

VDT-I-280/109 En
5.1982

With the introduction of the LE/LH-Jetronic the internal resistance of the solenoid-operated injection valves has also been changed.



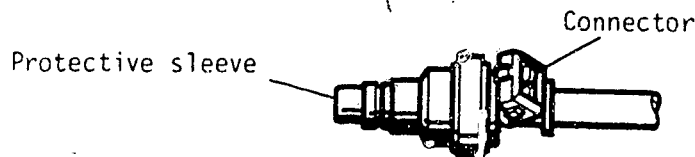
The connector has been left the same for cost reasons and to meet customer wishes.

Caution!

If L-Jetronic injection valves are installed in an LE/LH-Jetronic vehicle, either the control unit or the injection valves will suffer irreparable damage.

Note:

- Install only injection valves with the part number designated for the vehicle.
- As a guide, injection valves with 16.2 Ω internal resistance have a yellow protective sleeve.



- A colour coding (yellow) of the connector (see also VDT-I-280/5) is not generally intended for LE/LH-Jetronic injection valves.

Please direct questions and comments concerning the contents to our authorized representative in your country.

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by Robert Bosch GmbH, D-7 Stuttgart 1 Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

N2

Technical Bulletins

Fiat Argenta 120 i.e.



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28

PLUG CONNECTORS FOR
JETRONIC COMPONENTS
Parts sets

VDT-I-280/111 En

11.1984

(supersedes edition 11.1982)

Parts sets are available for replacement of Jetronic plug connectors. These consist of:

- Plug connector housing
- Protective cap (rubber sleeve)
- Contact springs

These parts are listed on microfiche EE...*.

* see microfiche EE00 under 0 280 ..

- Plug, black, 2-pin,
parts set 1 287 013 002 cable connector in conjunction with socket, 2-pin
- Socket, black, 2-pin,
parts set 1 287 013 001 for e.g.

Temperature sensor	0 280 130 0..
Auxiliary-air device	0 280 140 ..
Thermo-time switch	0 280 130 2..
Start valve	0 280 170 ..
Warm-up regulator	0 438 140 ..

- Socket, grey, 2-pin
parts set 1 287 013 003 for:

Solenoid-operated injection valve	0 280 150 ..
--------------------------------------	--------------

N3

Technical Bulletins

Fiat Argenta 120 i.e.



- Socket, black, 3-pin,
parts set 1 237 000 039 for:
Throttle-valve switch 0 280 120 ..
- Socket, black, 5-pin,
parts set 1 287 013 006 for:
Air-flow sensor 0 280 20. ..
(LE version)
- Socket, black, 6-pin,
parts set 1 287 013 004 for
Air-flow sensor 0 280 200 ..
- Socket, black, 7-pin,
parts set 1 287 013 005 for:
Air-flow sensor 0 280 20. ..
Air-mass sensor 0 280 211 ..
- Wiring-harness plug connector, black, 25-pin
parts set 1 287 013 009 for:
Control unit 0 280 0..
- Wiring-harness plug connector, black, 35-pin,
parts set 1 287 013 008 for:
Control unit 0 280 0..

The contact springs (minitimers) are also available separately under part no. 1 284 477 026.

The plug-connector housings are only available in the stated colours.

Responsible:

Robert Bosch GmbH

Division KH

Technical After-Sales Service (KH/VKD 2)

Please direct questions and comments concerning the contents to our authorized representative in your country.



After-sales Service

Motor Vehicle Service Information

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LIQUID PETROLEUM GAS (AUTOGAS) SYSTEMS AND
VEHICLES WITH K-JETRONIC

VDT-1-Gen. 052 En
10.1982

Fitting at a later stage

Vehicles with K or L-Jetronic are not suitable for fitting at a later stage with liquid petroleum gas (LPG) systems.

Numerous problems can occur, such as:

- Reduction of fuel flow through the injection valves due to deposits
- Stiffness or blocking of the K-Jetronic fuel distributor plunger (due to gumming or similar) in the course of time with "gas only operation."
- Increased danger of backfiring in the intake manifold (burbling) and thereby damage to the air-flow sensor.

Guarantee

Guarantee claims for failed Jetronic components from vehicles thus converted will not be accepted.

Conversion to liquid gas operation is made at the risk of the vehicle owner.

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by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

N5

Motor Vehicle Service Information

Fiat Argenta 120 i.e.



After-sales Service

Motor Vehicle Service Information

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UNIVERSAL TEST ADAPTER

VDI-I-Gen. 1001 En

1.1982

1. Application

The multiplicity of different fuel-injection and ignition systems at present available on the market, as well as the advances in development which can be expected in the future, demand a new testing concept. In order to maintain the outlay for test equipment, and hence the costs, at a reasonable limit we have developed the universal test adapter.

The following systems can be tested using a test-adapter universal unit together with adapter leads suited to the system in question:

1.1 Systems which are already being fitted as series:

- L-Jetronic (1st generation)
- LE-Jetronic (2nd-generation L-Jetronic)
- Motronic (with the new connector designation, refer to the vehicle-specific instructions!)

1.2 Systems whose introduction is planned:

- Motronic with gearbox control
- KE-Jetronic
- Mono-Jetronic
- Electronic ignition system with ignition map (EZf)

2. Delivery dates and Part Numbers

Available as from 2.1982.

2.1 Universal test adapter (basic unit)

Part Number: 0 684 101 801

Designation: ETT 018.01

2.2 System adapter lead for LE-Jetronic (2nd-generation L-Jetronic)

Part Number 1 684 463 123

First application: For BMW 2.5/2.8 l engines as from 9.1981, and for Opel 2.0 l engines (Manta/Rekord) as from 9.1981.

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N6

Motor Vehicle Service Information

Fiat Argenta 120 i.e.



2.3 System adapter lead for Motronic with new connector assignment.

(Refer to the vehicle-related instructions!)

Part Number : 1 684 463 124

First application: Porsche 944 as from series production, BMW as from about 3.1982 (Europe)

2.4 System adapter lead for L-Jetronic (in preparation)

Further system adapter leads will be made available along with the introduction of the new systems as mentioned above.

3. Testing procedure

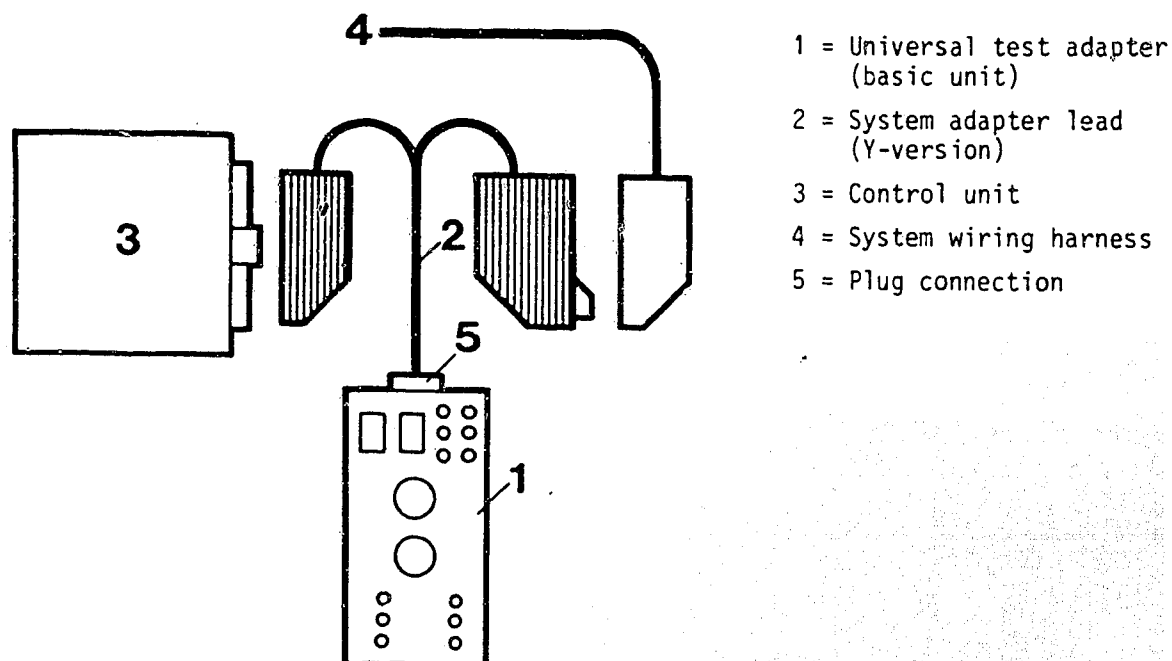
The systems and the components are tested for voltage and resistance values as well as for correct functioning. Evaluation is by means of a multimeter and the Motortester which are connected into the universal test adapter.

Depending upon the complexity of the system, interchangeable adapter lead model 1 or model 2 is provided:

3.1 Adapter lead for peripheral and function testing (Model 1)

The universal test adapter together with the system adapter lead is to be connected to the system wiring harness and to the control unit (e.g. Motronic).

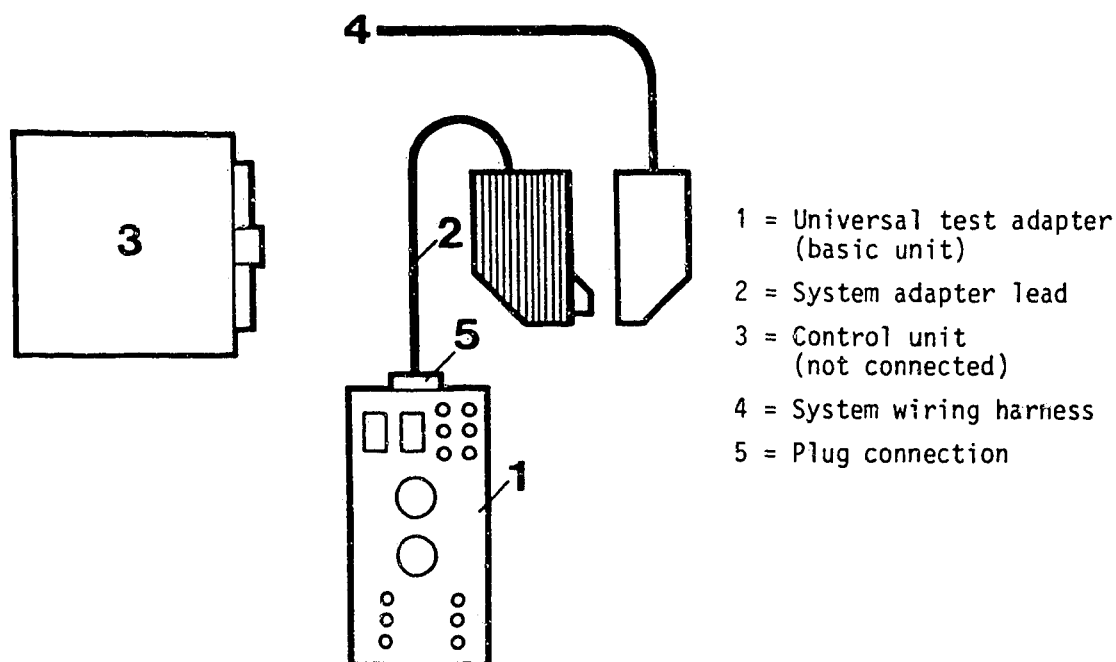
To be tested: Wiring harness with components and control unit.



3.2 Adapter lead for peripheral testing (Model 2)

The universal test adapter with system adapter lead, is only to be connected to the system wiring harness (e.g. LE-Jetronic (2nd-generation L-Jetronic)).

To be tested: Wiring harness with components (without control unit).

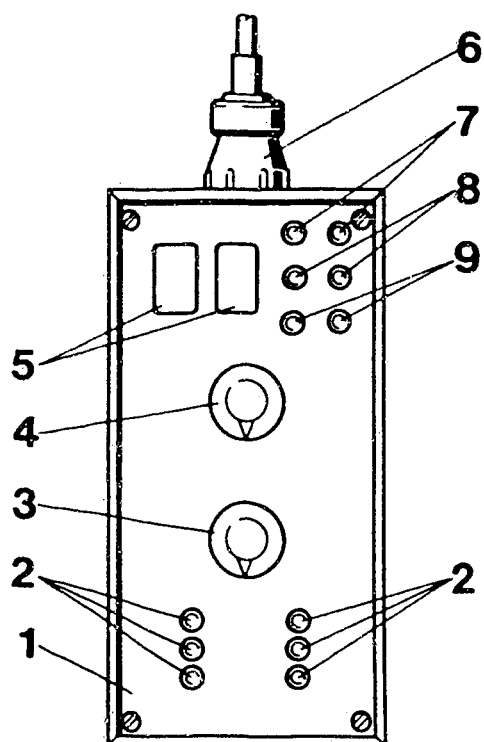


4. Construction of the universal test adapters

The universal test adapter is fitted with 2 program switches foottag and resistance measurement. The measured values are displayed on the multimeter connected to the universal test adapter. For reasons of safety, the voltage and resistance sockets are separated. In order to measure signals (e.g. injection pulses, ignition pulses), it is necessary to connect a Motortester to the measuring cavities (special input).

When carrying out functional tests with the control unit connected, selected push-buttons are pressed in a number of test-program steps in order to simulate a variety of different engine operating conditions the influence of which is evaluated using the Motortester.





- 1 = Universal test adapter (basic unit)
- 2 = Keyboard for simulation of various conditions e.g. engine temperature, throttle position etc.
- 3 = Program switch "Ohm" for resistance measurement
- 4 = Program switch "Volt" for voltage measurement
- 5 = Measurement "cavities" (for the special input from the Motortester)
- 6 = 63-pole plug-in connection for connecting the system adapter lead
- 7 = Measurement sockets (voltage measurement with a multimeter or with the Motortester)
- 8 = Measurement sockets (resistance measurement with the multimeter)
- 9 = Sockets for special functions (not yet allocated)

Notes:

1. The Motronic test adapter (0 684 101 800, ETT 018.00) will continue to be used for Motronic-equipped BMW vehicles (with old connector assignment) up to about year of manufacture 3.1982 (refer to vehicle-specific instructions).
2. Details on the operation of the universal test adapter, and the test specs, are to be found in the vehicle-specific after-sales service instructions.

3. Caution! Change of Part Number:

On the SIS-microfiches OPE-00/J22 (Coordinates A14 and A17) the new Part Numbers are as follows:

Universal test adapter: 0 684 101 801

Adapter lead : 1 684 463 123



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